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THE MAGAZINE FOR TRUCK AND BUS FLEET OPERATORS



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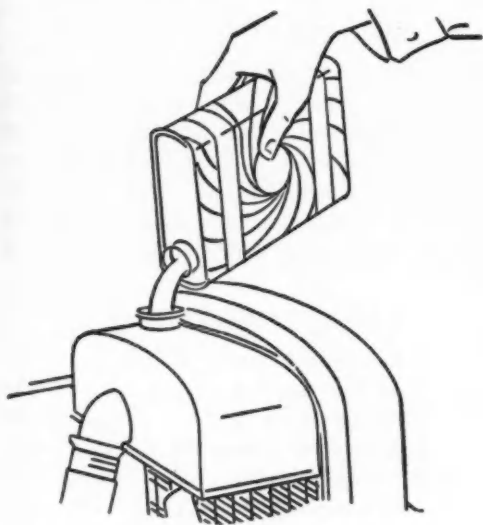
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# JOURNAL

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## READER DIGEST

### Who Should Pay Highway Costs?

Virtually all highway users now stand behind the movement for better, more adequate roads. But few stop to consider how much these better roads will cost and, more importantly, who will pay the bill? That's why Bill Bresnahan's story, beginning on page 51, is of vital interest to every truck operator. It tells who the highway beneficiaries are; why the finger is pointed at trucks; explains in easy-to-understand language the three most commonly used methods for determining cost allocation. The Overload, on page 20, contains some important introductory data.

### Practical Shop Hints From Consolidated

Shop made devices speed such jobs as battery repair, battery filling, engine tune up . . . enable fleet to save money in spring repair, in truck seat reconditioning. See pictorial article with detailed information on page 54.

### Additive Oils Cut Deposits, Wear Rate

Controlled laboratory and field tests prove value of Supplemental I and premium types of lubricating oil in reducing cylinder wall and piston ring wear rates. See page 56.

### Better Brake Work Doubles Drum Life

Springfield Bus fleet declares war on brake and chassis noise . . . finds that improved inspections, better adjustment, added care in turning down drums pays off in safer, smoother stops. Improved maintenance ups drum life by 50 percent. Page 62.

### Experts Suggest . . . How to "Heavy-Up" Springs

Truck leaf springs can be modified to some extent in the field to take added loads or to give better riding qualities. Springs are designed, however, to do a particular job, and fleetmen should consult engineers before major changes are made. A Leaf Spring Institute spokesman reports on the advice of experts. See page 68.

### How, Why, Where Engines Wear

Panel of seven experts take up subject of cylinder wall and ring wear at SAE Summer Meeting in Atlantic City . . . Some engineers state that wear rates are reduced in some cases by use of premium types of oils while others insist that there is no certainty. Researchers report on several methods of measuring wear in test engines. See page 64.



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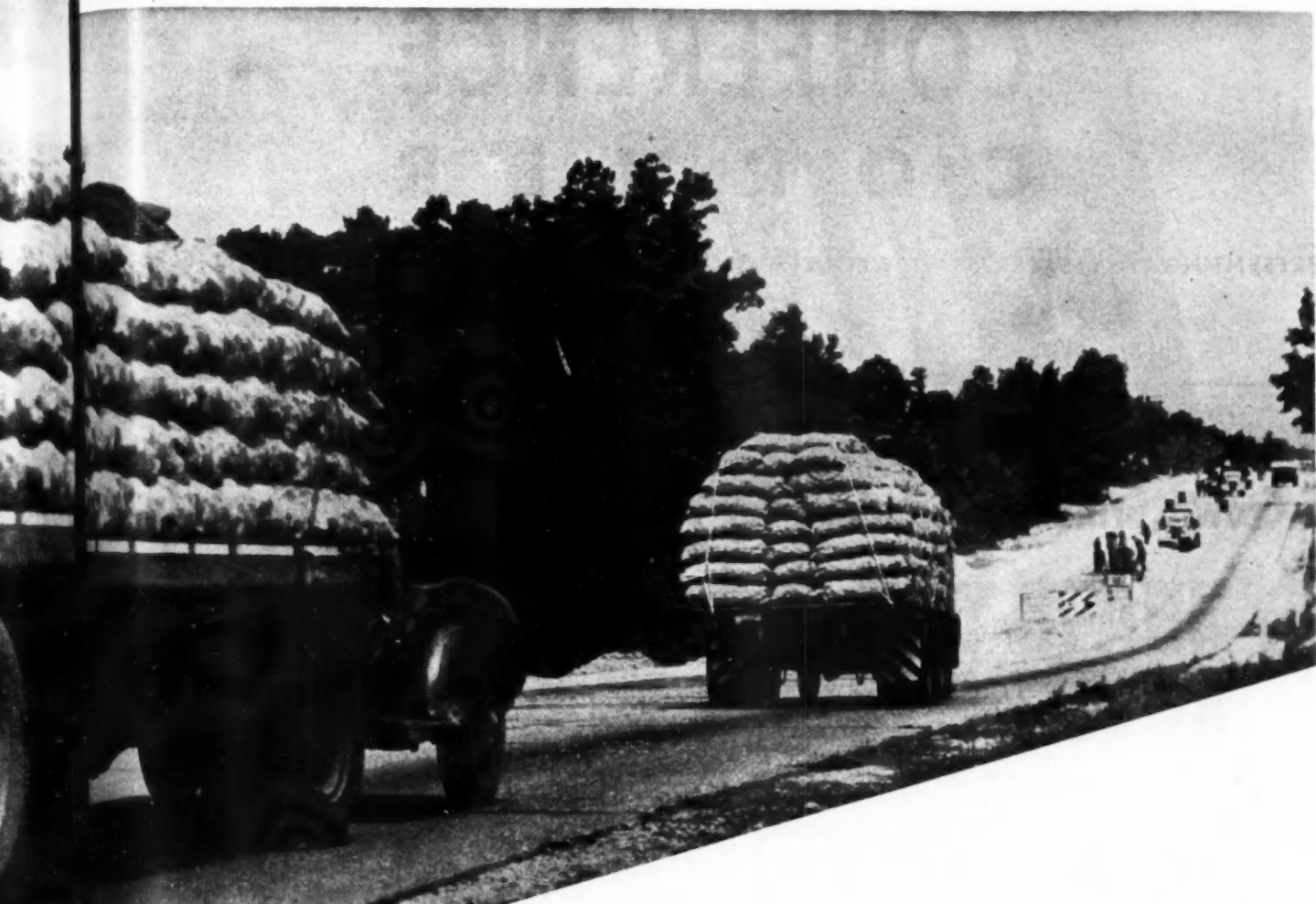




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# CONFERENCE C O R N E R

PRESENTING THE EXPERTS' VIEWPOINTS ON TIMELY SUBJECTS OF INTEREST TO FLEETS

## Crown Grinding Technique for Better Brake Drum Break In

by Ralph Super

The Timken-Detroit Axle Co.

IT HAS been considered proper practice for many years to grind brake shoe and lining assemblies after final installation on the axle. This operation was called "circle grinding" and the grinding mechanism was rotated on the axle spindle to insure a good job. The diameter of the brake drums were each carefully measured and the brake assembly was then processed so that the shoe curvature was as near that of the drum as possible. This proved to be a very beneficial process and was, and is still, used by many maintenance groups. The objective of this procedure was to insure good initial contact between the lining and drum over the entire lining surface through the removal of high spots. This resulted in the elimination of a high percentage of complaints on brake noise and grabby action.

It has been evident for some time that this procedure was not accomplishing the complete end result because: first, there was a considerable difference between the performance of the brakes when given a careful run-in for 500 or 1000 miles and that resulting from the immediate imposition of full load conditions without a run-in period such as occurs in bus service where the bus may be in peak load service a short time after leaving the shops with a new set of brake linings. Secondly, it became evident that the curvature of the brake shoe assemblies, after being in service for several thousand miles, was entirely different and smaller than that originally ground by the "Brake Doctor."

It was generally concluded that this condition was related to the stiffness of the brake shoes and was inherent in the design. This was not the entire story, however, and in recent years, as more careful investigation of brake drum design became a part of brake development work, the shape of the brake drum, when subjected to the pressure of the brake shoes, became an important aspect of this situation. It is pretty well known that even the heavy brake drums on commer-

cial vehicles distort or "egg shape" under the high radial pressures of the brake shoes. Actually, these drums are expanded in the sections adjacent the brake shoes and flatten in the sections between the shoes. This resultant elliptical shape of the drum gradually imposes itself on the lining wear pattern and is the shoe curvature observed after the brakes have been in service for some miles.

Working on this premise, it is evident that the brake lining at the heel and toe end of each brake shoe is being subjected to very high unit pressures with resultant high temperatures and damage or destruction of the material. This occurs despite a good circle grinding operation to prevent this condition. Actually, the lining should have been ground to the curvature of the drum as it exists when the brake is applied and not to the curvature of the "free" or unloaded drum. The brake drum is also being stressed excessively in the localized bending at the ends of the brake shoes. This situation explains the manner in which brake linings and brake drums are damaged during the run-in period or first 500 or 1000 miles of operation after a relining job.

Close observations have indicated a simple, economical solution to this problem. Those manufacturers and service groups that have used the idea call it "end relieving" or "crown grinding." It consists essentially of grinding the diameter of the brake assembly to a smaller diameter than the brake drum. The grinding is done from the axle spindle center and varies from .075 in. to .180 in. undersize. The amount depends on several factors. The density of the brake lining is one. The softer linings tend toward the larger figure. These figures will provide an "end clearance" of from .015 in. to .035 in. The flexibility or stiffness of the brake drum also is an important consideration in the selection of the figure. There should be no further question regarding extremely high contact pressures at the ends of the lining where this process is used. The initial contact with the drum is at the center of the shoe. The entire lining wear pattern in the first 1000 miles is one of extending the

(TURN TO PAGE 126, PLEASE)



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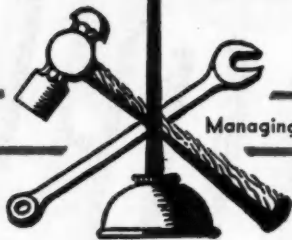
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# At Your Service

By M. K. SIMKINS

Managing Editor, Commercial Car Journal



## Cost Study May Add More Miles

An interesting point was brought out with regard to road failures and maintenance at an ATA round table discussion recently. E. B. Ogden, of Consolidated, in discussing the scheduling of maintenance work, suggested that where a fleet is experiencing *no road failures* in any particular assembly or part, there is a good chance that the fleet is overmaintaining. In other words, the operation is not getting *full mileage* from the unit. He said that a road failure now and then such as a differential, transmission, valve or even spark plug can be expected when the fleet is actually getting every last mile built into that part. The cost of the road failure should be weighed against the cost of rebuilding or replacement, he said, and the inspection schedule widened out to the very maximum consistent with economical transportation.

Of course, there is dynamite in this suggestion. Good records and a careful study of all costs should be made before the schedule is tampered with. However, there appears to be a certain amount of waste in nearly every fleet from the standpoint of replacing parts and assemblies too soon. While this may guarantee round trips, it may cost more than it is worth, so it might be wise for other fleets to re-evaluate the PM system to see if inspections can be extended and extra miles added.

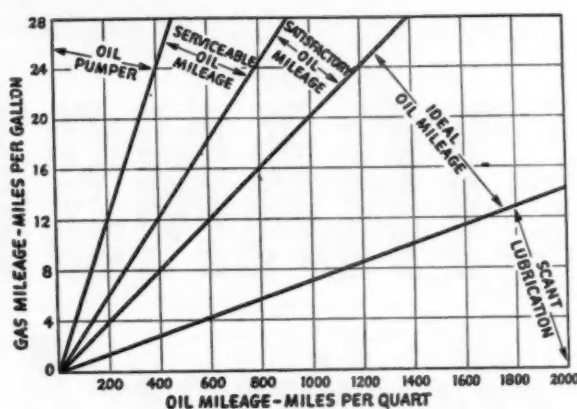
## Oil Consumption in Relation to Fuel Mileage—Chevrolet

The subject of oil economy in the operation of an automobile engine is one on which many misconceptions are evident. There are no base lines or maximum figures which will apply to all types of operations. Engine design, and condition, axle gear ratios, tire sizes and the type of usage must all enter into consideration where oil economy is discussed.

However, there is a definite relationship between oil economy and fuel economy, and where the fuel mileage is known, it is possible to plot a curve showing the oil economy expectancy for any type operation.

Relationship is shown on this graph. The oil economy expectancy of a Chevrolet passenger car or truck may be determined from this graph if the fuel mileage is known.

Four graph bands are shown as follows: 1. Oil



pumper; 2. serviceable oil mileage; 3. satisfactory oil mileage; 4. ideal oil mileage.

The figures along the left border represent fuel mileage in miles per gallon. The figures along the lower border represent oil mileage in miles per quart.

## Studies of Tire Performance

New information on the tread wear, power loss, and other performance characteristics of automotive tires has resulted from an extensive investigation now under way at the National Bureau of Standards. This program, under the direction of Dr. R. D. Stiehler of the NBS staff, has involved the development of a number of new and improved methods for predicting tire performance. Through the use of statistically planned experiments, it has been possible to determine the effects of many variables not previously isolated.

Power loss in tires may be defined as that portion of the effective power produced by the engine which is dissipated in the tires as heat. This loss is disadvantageous for two reasons. First, it increases the temperature of the tire. In large tires, the temperature in service may actually become higher than the temperature at which the tire was vulcanized; as a consequence, the textile cords and the rubber rapidly deteriorate and the tire fails. The second disadvantage of a high power loss is the resultant increase in fuel consumption and in the power required of the engine. In the case of tractor-trailers with as many as 18 tires, any increase in power loss in the tires

(TURN TO PAGE 14, PLEASE)

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# At Your Service

Continued from Page 10

may have a pronounced effect on both vehicle performance and fuel consumption. The effect is particularly noticeable on hills, where the magnitude of the power loss may determine whether shifting of gears is necessary.

Recently the Bureau has constructed a machine of special design which measures the amount of power lost in a tire when load, tire pressure, speed, tractive effort, and cornering are independently varied. The machine employs two dynamometers. One measures the power required to drive the tire while the other measures the tractive effort, or the power transmitted by the tire to a steel drum. The power loss is the difference between these two measurements after correction has been made for windage and for power loss in the bearings due to friction. Power loss is found to be influenced by both composition and design of the tire.

Endurance or fatigue is measured by running the tire against a steel drum continuously for several days. The process is continued to failure for research studies but is discontinued after a specified time in testing for compliance with the Federal Specification. Running temperatures may also be measured during the test. A spread in running temperature of 68 deg F has been found in tests on different brands of the same size of tire.

When a tire is poorly designed or when inferior tread compound is used, cuts or cracks in the tread grooves may rapidly increase with length in service and cause premature failure. This condition is determined in a test which is conducted along with the endurance test. Predetermined numbers and lengths of cuts are placed in the tread grooves before the endurance test, and the lengths of the cuts are measured after the test to determine the cut growth.

Recently the Bureau has developed an improved method of test for tread wear which utilizes the weight-loss method but also employs a statistical design, based on the latin square, to compensate for differences in the treatment received by each tire. In this way, differences in wear due to the use of the tires on different test vehicles or in different wheel positions are taken into account. Because of changing climatic and road conditions, tires are always evaluated relative to those included in the same road test.

## Point Alignment—Ford

Distributor points must be correctly aligned upon installation to insure normal point life. Any misalignment of the point faces will cause premature wear, overheating, and serious pitting of the point surfaces which can cause unsatisfactory engine operation.

In addition to misalignment, point life can also be shortened by excess lubricant on the distributor cam. After the distributor warms up, the excess lubricant is thrown off the cam and spattered on the contacting surface of the points, resulting in burning of the points and decreasing point life.

## New Studebaker Gaskets

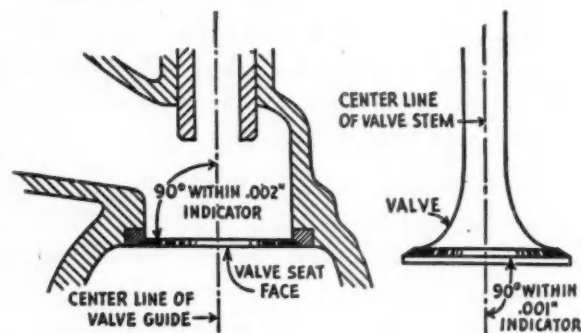
To prevent the possibility of premature or repeated failure of exhaust manifold gaskets in Commander Six-type engines, a new exhaust manifold, using three studs instead of two, is now available. This manifold requires a new exhaust pipe assembly and a new exhaust manifold-to-pipe gasket.

## International Harvester

LM-120 series chassis now have a 2 deg wedge plate (IH part No. 63645R1) installed between the front springs and axle spring seats to reduce the caster angle to the new 0 deg to 1 deg setting to alleviate front end shimmy.

## Valve Seat Inserts Diamond T

Valve seat inserts are used in Continental engines in the exhaust positions only. Inserts may be re-ground or replaced. Replacement inserts are furnished in oversizes of .010 in., .020 in. and .030 in. Old inserts should be removed with a puller but may be broken out if a puller is not available. If they are to be broken out, extreme care must be taken not to damage the cylinder head. Ream out excess in T6427 engine .003 in. to .005 in. less than diameter of oversize insert and in R6572 engine .0045 in. to .0065 in. less than diameter of oversize insert. Increase depth .005 in. to .010 in. greater than the thickness of the insert.



Pein the edge of the recess slightly. Make certain there are no air spaces between the valve seat insert and the cylinder head as this air space greatly reduces heat transfer and affects the life of the engine.

A minimum of grinding to obtain a good seat is desired. The valve seat must be square with the guide within .002 in. taken by revolving indicator. If the seat face width is appreciably widened in grinding the top should be cut back with a 15 deg cutter. The seat angle should be 44 deg on the valve and 45 deg on the valve seat insert. This 1 deg interference angle insures tight seating at outer edge of valve and tends to prevent the buildup of deposits.

## Fruehauf Guarantees Springs

Fruehauf Trailer is guaranteeing the gravity tandem torsion bar springs on tandem trailers for life. Warranty covers replacement parts and labor costs in excess of \$150 for 100,000 miles of service, regardless of elapsed time. It applies to hangers, shackles, axle bracket assemblies and gear boxes. Ninety-day check-ups are required, however, at Fruehauf branches or authorized representatives.

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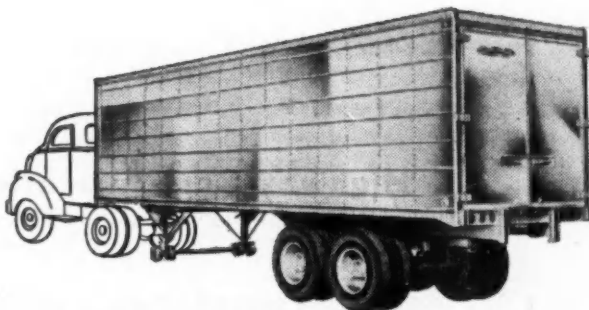
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COMMERCIAL CAR JOURNAL, July, 1952

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19

The

# OVERLOAD

E D I T O R I A L C O M M E N T

## Highway Cost Allocation—An Important Step Nearer

**L**AST month on this page we made a nomination for the most important question of the year. It was simply: What is a fair share of highway expense to be paid by trucks? We pointed out why we believed that the solution of this question was of vital interest to every fleet operator since the outcome would directly affect the flow of dollars from the industry's pocketbook.

Had we been asked, however, we would have been the first to admit that a real solution to the problem looked extremely remote. That was before ATA's Bill Bresnahan produced the masterpiece which begins on page 51 of this issue.

In "Who Should Pay How Much of Highway Costs" we believe that Bill has made a real contribution to a better understanding of the problems involved. First of all the article points out why current pressures for greatly needed highway improvement mean more dollars from all highway users, with the focus on trucks.

Further along the Bresnahan report outlines the three most widely used theories for allocating highway costs. It exposes the fallacies of the gross ton-mile theory. It reveals the unrelated aspects of the operating cost theory. And finally it shows how the incremental theory of apportioning highway costs can provide the most logical solution, provided proper safeguards are applied.

About now, however, we can hear some readers say "those are mighty high-falootin' terms, pardner; we're just running a bunch of trucks; we don't pretend to be economists or highway engineers!"

But that's just the point! Economists and highway engineers *are* figuring out how to spend more of *your* dollars right now. In Pennsylvania a joint commission is charged with determining "whether contributions now being made by the trucking industry represent its fair share." In 18 states we already have varieties of the ton-mile tax. In nearly all states special truck taxes of one kind or another are digging deeper and deeper into the pocketbooks of all but perhaps the *very* lightest truck elements. In most states even these are included.

That's why it is so vital to be prepared when a legislator in your state comes up with a plan, or a theory, or "technical study," or a rose by any other name.

And that's why we are proud to bring you the special report referred to above. It is easy reading and very worthwhile. When you finish it, you will be better prepared to meet the economists and the planners on their own terms. You and your associations can be of real help to those who are sincere in their efforts. And you can expose the phoneys for what they are.

*Bart Rawson*  
Editor



# WASHINGTON RUNAROUND

by KARL RANNELLS Washington Correspondent

## Commerce Dept. Eyes Transportation

Aside from the operation of its Bureau of Public Roads, the Commerce Department is quietly taking an increased interest in transportation matters. In recent weeks, for example, it filed a petition to intervene in a case where carriers were seeking ICC authority to transport explosives; it set up framework of an advisory committee of businessmen and industrialists for promoting highway safety; and it ordered a survey of ways and means of getting more support of the Highway Safety Conference of which Secretary Sawyer is chairman.

Commerce is also getting started on a survey of motor and other transport—including airlines and railroads—which will study subsidies, grants, and a wide variety of subjects. Of particular interest will be the subsidy question and what types of transportation use highways most.

Reliable sources say that out of this will eventually emerge, ready by the next session of Congress, recommendations for imposition of a users' tax for motor vehicles—possibly along the lines of the ton-mile system.

## NPA Studies Truck Sales

National Production Authority started a study last month of factory truck sales since July, 1951—with the idea of finding out what, if any, changes should be made in the percentage ratio now used for allotting production quotas to individual truck manufacturing firms. The agency has also been looking over a proposal by the industry that the percentage ratio of light, medium, and heavy truck production should be revised. It was recommended that production of lights should be increased from 58 to 61 per cent of the total, deducting the 3 per cent from the heavy and medium quotas.

Truck manufacturers generally are not in favor of partial controls. Speaking for the industry, the industry's advisory committee has gone on record as advising NPA that both the controlled materials plan and unit output quotas should be retained until the agency is ready to kick both overboard.

## One Million Trucks, 1952—Maybe

Whether truck production for 1952 reaches the mobilization target of at least 1,000,000 vehicles seemed last month to depend on a number of factors. Indications were that production would be past 450,000 units by June 1. But the big question was how long would the steel strike last and how much truck pro-

duction would be lost. Steel labor and management were still deadlocked in mid-June.

Meanwhile, as of that time, Defense Production Administration had made no move to revise either the third quarter materials allocations or the tentative quotas for the fourth. Production of 285,000 trucks for domestic sale was still aimed at for the last three months of 1952.

## Congress to Study ICC

Congress had before it last month a proposal (S. Res. 332) introduced by Sen. Edwin C. Johnson, D., of Colo., head of the Interstate & Foreign Commerce Committee, which, if approved, would launch a \$100,000 study of the ICC. The study would be expected to show how that agency could be streamlined for greater efficiency.

Meanwhile, sources at the Capitol said it was still unlikely that action would be taken this year on any of the controversial proposals affecting the ICC and transportation generally. Press of "must" legislation before the political conventions seemed certain to push these bills aside. Should Congress reconvene after the conventions, the sources said, it would be only for a short session with only matters of critical importance to be taken up.

## To Study Agricultural Distribution

A survey of agricultural distribution is under way by the Defense Transport Administration, completion of which is scheduled for about August 1. It covers the movement of fresh vegetables by motor truck to determine the quantity being transported from production areas to consuming or market centers. The survey is intended as a basis for creating a plan for meeting sudden emergency of all-out war demand for changes in equipment or routes.

## Nine Million Trucks Registered

The Bureau of Public Roads has reported that truck registration in the United States passed the 9,000,000 figure in 1951, a gain during the year of 4.6 per cent from the 1950 total. Also, during the year bus registrations gained 3 per cent to a new total of 223,652 vehicles. Combining its registration report with gasoline consumption, the Bureau said that fuel consumption by all types of vehicles, including passenger cars, amounted to 38 billion plus gallons. In addition, 5,500,000 gallons were used for non-taxable non-highway usage.

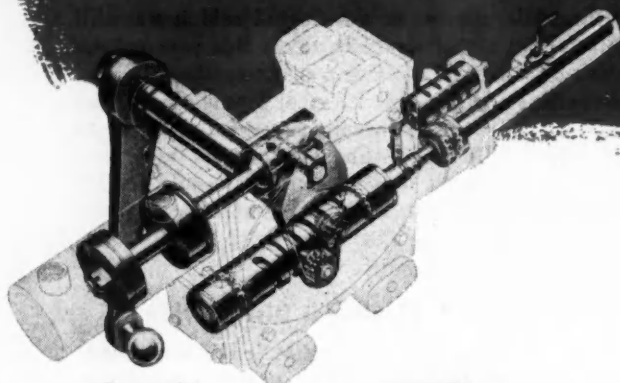
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# DETROIT DISPATCH

by LEN WESTRATE Detroit News Editor

## Steel Strike Shows

Truck production is due for a setback in July because of the steel strike. Production was maintained pretty well through June, but then interruption in supply lines hit hard, and output for this month will be sharply curtailed. Even though the effects of the strike will be felt for some time, it still is general opinion in the industry that a million or more trucks will be built this year. Through June, production was something in excess of 600,000 so chances for another 400,000 in the second half are extremely good. Sales have picked up during the last couple of months, but field inventories in medium and heavy trucks are in much better shape than is the case with passenger cars, and no particular shortage is expected to result except in the case of light units.

## Truck Tire Prices Skid

As had been predicted ever since the price of natural rubber started to skid, prices of truck tires have been reduced from 2½ per cent on small sizes to 7½ per cent on larger casings. Goodyear was the first to make the price cut, pointing out that savings in production costs were possible because of lower natural rubber prices. For this reason, reductions were less on smaller size than on larger ones, since smaller tires use a lesser percentage of natural rubber. Passenger car and truck tubes also were reduced 5 per cent. Price of natural rubber has dropped from a high of 81 cents a lb two years ago to about 30 cents at present.

## Wanted—Shorter Dimensions

The definite trend toward the 35-ft trailer is putting pressure on manufacturers to shorten bumper-to-back-of-cab dimensions on tractor trailers. Shortening up the dimensions creates problems for designers in getting enough leg room for drivers and to arrange components under the engine hood. For instance, one company would like to increase its use of shrouds so that fan pull on the engine could be decreased but it requires setting the fan back farther from the radiator, a difficult problem when the trend is to pull these elements together in an effort to shorten cab-to-bumper length. Some engineers think that C.O.E. jobs are the only satisfactory answer and indicate that the trend toward this type is increasing.

## 12-Volt Systems Studied

Truck builders are watching with interest and are cheering on passenger car builders who are expected to introduce 12-volt ignition on cars, possibly beginning

with some 1953 models. They point out that they would like to see it adopted because volume output of 12-volt equipment would make it available for trucks at reasonable cost. One obvious advantage on trucks would be greater cranking power for cold starts and to meet the load of higher compression ratios. A changeover to 12 volts might complicate hook-ups with current trailers with 6-volt systems, but an inexpensive voltage step-down device can be installed.

## May Add Life to Mufflers

A new aluminum dipping process for automotive parts developed by General Motors may offer some significant advantages for truck operators. It would be particularly useful for coating mufflers and other parts of the exhaust system, since it has high anti-corrosion value and makes steel parts much more resistant to heat. It now is being used for coating fabricated steel manifolds for some of the Diesel engines made by G.M. Detroit Diesel Div. Another possibility may be that the heat resisting properties obtained by process might be useful in truck valves. The process is very new and the applications have not been thoroughly studied, but it is definitely a promising development.

## New Rubber for Truck Tires

A synthetic rubber with low heat build-up qualities and suitable for heavy-duty truck tires long has been the objective of the tire industry. R. P. Dinsmore, vice president of research and development for Goodyear, while not saying that such a rubber is available, hints strongly that the new oil master batch process developed by Goodyear in cooperation with the Government, produces a man-made rubber which gives promise of having qualities that may make it suitable for heavy-duty truck tire use. With world rubber prices sagging, the development might not be as significant at the moment as it would have been a year ago when crude rubber prices were soaring.

## Engineers Eye Automatic Drives

Most truck engineers agree that automatic drives on larger trucks are coming, but still are some time away. A lot of work is being done on the problem, however. The general feeling is that if a torque converter is used, a gear box in conjunction will be necessary and some type of lock-out for the converter to overcome the problem of over-run in downhill operations and to provide a direct connection for compression braking. Another must is a lock-up for lower gear ranges to prevent up-shifting on downhill operation.



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## Ramco 10 UP

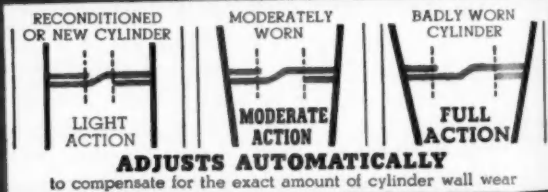
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FROM THE OLDEST TO THE NEWEST TYPE!

# CCJ REPORTS

## on News of the Industry

### Los Angeles Show Packs Crowd

While trucking circles in most parts of the country looked askance on the idea of bigger and better truck shows, the third annual National Truck, Trailer and Equipment show in Los Angeles turned in an impressive record. During the four-day period, June 12 to 15, 31,474 individuals combed the exhibits of 114 manufacturers whose displays ranged all the way from 1898 models to turbine engines; from the latest in cab-over-engine tractors to trailers with moveable axles. CCJ will have further details on some of these next month.

### Quarterly Freight Report

Motor carrier inter-city freight volume during the first quarter of 1952 was 4 per cent below the same period of last year, but 20 per cent above 1950's first quarter, according to an American Trucking Associations, Inc., report. This tonnage drop reflected the overall trend in business, with the February work stoppage in many parts of the country probably an important contributing factor in the decline. The two regions hit hardest by strikes, southern and southwestern, however, showed tonnage increases in the first quarter of this year over the same period of 1951.

Preliminary figures based on operations of 1319 Class I inter-city carriers show 43,757,341 tons of inter-city freight transported during the first quarter

1952 compared with 45,565,235 tons in the first quarter 1951, dropping the ATA index for the quarter to 258. The previous record established last year was 269. The base year of the index is 1941.

### State Officials Meet

Reciprocity among states with regard to laws regulating the movement of freight by motor vehicle was strongly urged at the Southwestern Governor's Conference on Problems of Interstate Truck Operation meeting in Oklahoma City, Okla., in June. Participating states included Arizona, Arkansas, Colorado, Kansas, Louisiana, Missouri, New Mexico, Oklahoma, Texas and Utah.

More than forty delegates and guests attended the Conference and heard Oklahoma's Governor Johnston Murray request that a permanent interstate compact be formulated in order to bring about needed reforms in truck administration and taxing practices.

### Cass Motor Vehicle Director

Robert Cass, previously deputy chief of the motor vehicle branch, NPA, has stepped up to replace Courtney Johnson, director of the division, who returned to the Studebaker Corp. George R. Davis becomes deputy director and Lawrence Beerman is now assistant director, the position previously held by Mr. Davis.

(TURN TO PAGE 95, PLEASE)

## DATES and DOINGS

JULY 26—Maine State Roadshow, Bass Park Fairgrounds, Bangor, Me.  
AUG. 1-3—North Dakota Motor Carriers Assn. Annual Convention, Dacotah Hotel, Grand Forks, N. D.  
AUG. 11-13—SAE West Coast Meeting, Fairmount Hotel, San Francisco, Calif.  
AUG. 30-SEPT. 2—Mississippi Motor Transport Assn. Annual Convention, Buena Vista Hotel, Biloxi, Miss.  
SEPT. 2-4—Pennsylvania Motor Truck Assn. Truck Roadshow, Hershey, Pa.  
SEPT. 4-6—Virginia Highway Users Assn. Annual Convention, The Chamberlin Hotel, Fort Monroe, Va.  
SEPT. 5-6—Michigan Trucking Assn. Annual Convention, Park Place Hotel, Traverse City, Mich.  
SEPT. 8-12—Fleet Supervisor Training Course, University of Denver, Denver, Colo.  
SEPT. 11-12—Wisconsin Motor Carriers Assn. Annual Convention, Pine Point Lodge, Elkart Lake, Wis.  
SEPT. 11-12—Tennessee Motor Transport Assn. 18th Annual Convention, Peabody Hotel, Memphis, Tenn.  
SEPT. 11-13—Pennsylvania Motor Truck Assn. Fall Meeting, Bedford Springs Hotel, Bedford Springs, Pa.  
SEPT. 15-17—Truck Body & Equip. Assn., Convention and Exhibit, Chase Hotel, St. Louis, Mo.  
SEPT. 16—Massachusetts Motor Truck Assn. Annual Convention, New Ocean House, Swampscott, Mass.  
SEPT. 17-19—West Virginia Motor Truck Assn. Annual Convention, Daniel Boone Hotel, Charleston, W. Va.  
SEPT. 17-19—National Assn. of Motor Bus Operators, Annual Convention, Drake Hotel, Chicago, Ill.

SEPT. 18-20—Nebraska Motor Carriers Assn. Annual Convention, Fontenelle Hotel, Omaha, Nebr.  
SEPT. 18-20—Indiana Motor Truck Assn. Annual Convention, The French Lick Springs Hotel, French Lick, Indiana.  
SEPT. 22-25—American Transit Assn. Annual Convention, Traymore Hotel, Atlantic City, N. J.  
SEPT. 22-26—Pennsylvania State College Motor Fleet Supervisor Training Course, Penn State Campus, State College, Pa.  
SEPT. 23—Motor Transport Assn. of Connecticut Annual Convention, Bond Hotel, Hartford, Conn.  
SEPT. 23-30—Kansas Motor Carriers Assn. Annual Convention, Broadview Hotel, Wichita, Kansas.  
OCT. 6-7—North Carolina Motor Carriers Assn. Annual Convention, Carolina Hotel, Pinehurst, N. C.  
OCT. 6-10—American Trucking Assn. Annual Convention, Waldorf-Astoria Hotel, New York, N. Y.  
OCT. 6-10—American Trucking Assn. National Truck Roadshow, Madison Square Garden, New York, N. Y.  
OCT. 6-10—New York State Motor Truck Assn. Annual Convention, Waldorf-Astoria Hotel, New York, N. Y.  
OCT. 6-10—Driver-Trainer Course, University of Nebraska, Lincoln, Neb.  
OCT. 20-24—National Safety Council 40th Annual Exposition, Conrad-Hilton Hotel, Chicago, Illinois.  
OCT. 22-24—SAE Annual Transp. Meeting, Wm. Penn Hotel, Pittsburgh, Pa.  
OCT. 29-31—American Society of Body Engineers Seventh Annual Technical Convention, Rackham Memorial Bldg., Detroit 2, Mich.



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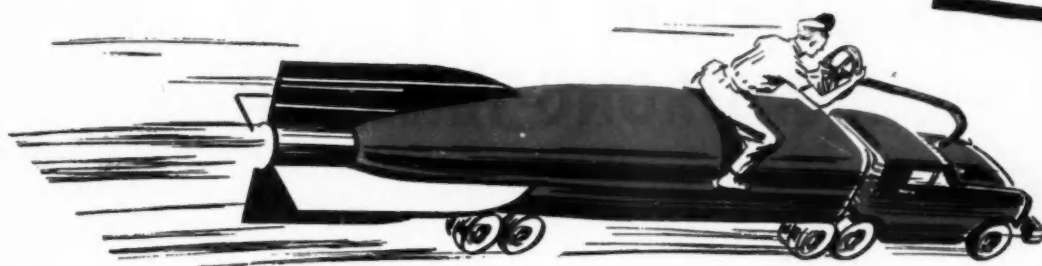
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## BULLETIN BOARD



C. WHITMAN

## Have You Signed the Pledge?

The Anti-Speeding Campaign initiated recently by ATA offers you drivers a great chance to show how good you really are. When you sign the pledge "fur safety 'n' agin' speeding," you are assuming an important part in the future of the trucking industry . . . You may be saving someone's life. Success of this campaign depends upon your allegiance to a safe, sane speed consistent with traffic and road conditions.

There are a lot of reasons why this program is necessary. It ushers in a progressive approach toward safer transportation. It will save your industry many a black eye. Here's why . . .

When you roar through a sleeping village and scare the mayor out of his sack, he's going to take notice—through the courts. If he doesn't put you on a back street, he will cut your speed down to size. And some local ordinances can be mighty effective.

The car driver, the city planner, or even Pop, who is sleeping one off is going to be pretty upset when disturbed by what appears to be a fast moving truck. Sound and size multiply the effects of speed so that your truck catches hell regardless of whether you are speeding. Best thing to do is hush it up, and pull it down somewhere below the speed limit if necessary.

Today you don't have to "run for a hill" or "make time with a hot load" or "beat the storm." But you do have to be able to stop at an intersection when some bloke takes you for a fly speck on his glasses. You do have to negotiate some pretty tough curves and some treacherous, narrow, sloppy roads . . . And you have to do it safely. A lower speed makes up for a lot of other driving deficiencies.

Speed is one of the outstanding complaints against the trucking industry. But we're out to level off that criticism with some better accident records. So get behind this Campaign and get out in front with your "Fur 'N' Agin'" pin.



**"Compare mileage.  
Compare costs. You'll switch  
to ARMSTRONG TIRES, just  
as I did!"**



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● "The fleet owner who doesn't watch his costs today is just out of luck. Overhead will kill him.

"Take tires. I've learned a lot about tires by keeping mileage cost records ever since starting in business. They proved to me that for my money Armstrong is one really great tire buy.

"For original cost, operating cost and retread life it tops every other tire I've used.

"You'll find Armstrongs on all of my trucks. And every one of those Armstrongs is giving me one hundred cents in value on the dollar.

"Talk about buys! If there were more buys like Armstrong, keeping overhead down would be a cinch!"

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# ARMSTRONG TRUCK TIRES

<sup>1</sup>Since 1912, millions of tires for cars, trucks and tractors have proved Armstrong's leadership in value.





Steno Lou: "Well, carry on dearie, carry on. Tell me more about it."

Steno Sue: "At the beach last summer as I was coming out of the water I looked down and saw I had lost the lower part of my bathing suit."

Steno Lou: "Gee whillikens, what did you do?"

Steno Sue: "I did what any respectable girl would do. I covered my face with my hands and ran like blazes to my cottage."

ccj

Judge: "On what grounds are you applying for a divorce?"

Road Truck Driver: "Extravagance, your honor."

Judge: "Extravagance? How's that?"

Road Truck Driver: "She kept on buying ice after I had installed an electric refrigerator."

ccj

Steno Lou: "Twasn't more than a minute after I got in bed last night before I was asleep in the arms of Morphine."

Steno Sue: "You mean Morpheus, don't you? Morphine is a dope."

Steno Lou: "Well? Do you know of a bigger one than my husband?"

ccj

The OS&D Clerk and his wife were in the midst of a violent quarrel, and he was on the verge of losing his temper.

"Be careful," he said to his spouse. "You'll bring out the beast in me."

"So what," she replied. "Who's afraid of mice?"

ccj

Traffic Manager's Son: "Teacher, I haven't any eraser."

Teacher: "Use the little girl's behind."

ccj

Safety Director: "Weaver, this is the second rear end collision report I've had on you within the past six weeks. What's happened boy, your brain seems to be out wool gathering. Is something on your mind troubling you?"

Weavin' Willie: "Yessir, I guess so. I just can't understand it. Sometimes there's nothing but pictures of pretty girls running through my mind."

Safety Director: "Oh, yeah! I can understand that. They don't dare walk."

ccj

Personnel Manager: "Miss Jones, I believe you have the necessary qualifications to make a good stenographer."

You read back the letter which I dictated with only a minor error or two, and I notice that you have a typing speed of 60 words a minute. However, we insist that our stenographic help be better than average in spelling. Are you a pretty good speller?"

Cute Applicant: "I think so, sir. I didn't have much trouble in school."

Personnel Manager: "How do you spell Mississippi?"

Cute Applicant: "The river or the state?"

ccj

Steno Lou: "No honey, it isn't either of those you mentioned. It's Broadtail. I certainly wished it were called something besides that, too, because my husband fancies himself a comedian."

ccj

Handsome Herbie, our City Commercial Agent, says that television has certainly done things to people. He has a friend who turned his radio on by mistake and thought he'd gone blind.

ccj

Safety Sadie: "I'm giving a little, small, intimate party tonight and I'd like you to come over. Let's see, I have to make out this shopping list and I'm puzzled over what to serve. I'll need material for sandwiches and some ginger ale or sparkling water. What kind of chaser do you prefer?"

Catty Cora: "Tall, dark, handsome, and loaded with money!"

"Cici Jay"



"Wait a minute bub, I drove last time!"

She: "Can you tell me the name of this school, young man?"

He: "Sorry, I only play football here."

ccj

Smiling Sam, the bus driver on our suburban run, says that two extremely gorgeous gals got on his bus the other evening and sat down in the seat just behind him. During the course of their conversation, he inadvertently overheard one say to the other: "Has the boss put in for your vacation yet?"

ccj

The parts clerk snatched at the phone, spun the dial, panted in to the mouthpiece:

"Dr. Quack? I need you quickly, Junior swallowed my fountain pen."

"Yes, sir, I'll come right over."

"What'll I do in the meantime?"

"Use a pencil."

ccj

Safety Sadie: "Lou is quite a gold digger, isn't she?"

Catty Cora: "Yeah, she certainly possesses a marvelous gift of grab."

ccj

Spring training was over and the hometown baseball club had just officially opened its season.

The Operations Manager for one of the local motor carriers noticed an alarming number of employees seemed to have funerals to attend on the afternoons of home games. In order that his department heads and supervisors might be better prepared for their absence, he placed the following notice on all bulletin boards:

"Any employees desiring to attend the funeral of a near relative must notify their respective supervisors before ten A.M. on the day of the game."

ccj

Dangerous Dan, our Yard Hostler, calls his girl Candy Bar because she is half nuts.

ccj

Steno Lou: "Can you tell me one of your most embarrassing moments?"

Steno Sue: "Yes, I can tell you one of the worst ones that ever happened to me."

Resume Work



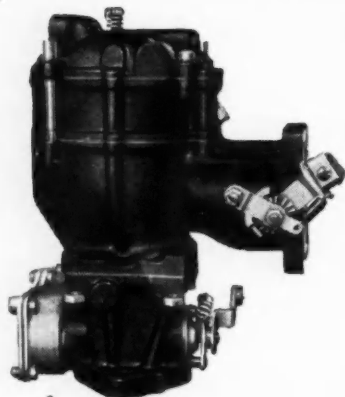
Does He Knock or Boost Your Truck?



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and  
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By William A. Bresnahan\*

Director of Research, American  
Trucking Associations, Inc.

## CCJ FEATURE SECTION

As pressure for more and better highways grows, many interests are eyeing trucks for the lion's share of the bill. That's why it is so vital that fleetmen understand the problems and be able to intelligently discuss the question:

# Who Should Pay How Much of Highway Costs?

REHABILITATION of our overcrowded and outmoded highway system to accommodate the breath-taking increase in motor vehicle use is going to take a lot of money. That is why a question which once was aca-

demic now has become a burning national issue. The question is simply this: Who is going to pay the bill?

The trucking industry has a real battle on its hands to avoid becoming

the whipping boy for those who are seeking an easy, or selfish or punitive answer to the question.

Virtually everyone who has given even casual thought to the problem of highway finance is agreed upon the fundamental premise that the roads and streets should be paid for by the users or beneficiaries thereof.

### Highways Aid Three Groups

THERE is also general agreement as to who the beneficiaries are. They fall into three general classes:

1. *Property owners*, who benefit directly from the access provided by roads and streets. Property owners are expected to pay their fair share of the cost through property taxes earmarked for roads and streets. There was a time when property owners paid the lion's share.

(TURN TO NEXT PAGE, PLEASE)

\*This article is based on a paper presented to the Pennsylvania Motor Truck Assn. Attention is also invited to editorial comment on Page 20.



In 1925 highway users paid 34 per cent of expenditures; but since 1941 users have paid in more than total costs



# Who Should Pay How Much?

Continued from Page 51

2. *The public generally* who benefit from police and fire protection; access to schools and hospitals, national defense; post roads, interstate commerce, etc. Federal highway-aid appropriations are a recognition by the Federal Government of its obligations to help maintain a highway system adequate to meet the needs of national defense and the postal system.

3. *Owners of motor vehicles*, who are expected to help pay the cost of roads and streets through special levies such as registration fees and fuel taxes.

The three major classes of beneficiaries have been contributing toward the cost of highways for many years, in one degree or another. However, since the early 1920's there has been a steady shifting of the burden to the owners of motor vehicles.

## Users Share Has Tripled

THIS shift is shown graphically in Fig. 1. Note that in 1925, motor vehicle taxes amounted to 34 per cent of total expenditures. However, in 1950, motor vehicle taxes were 103

per cent of expenditures. You will observe that on this basis, motor vehicles taxes have exceeded road and street expenditures almost continually since 1941.

But don't be misled by this chart. The other beneficiaries still are making a contribution, although their portion of the total has declined significantly. Keep in mind that all of the money collected in special taxes from motor vehicle owners is not spent on highways. In a number of states substantial amounts are diverted. Moreover, Federal-aid appropriations are only about one-third of amounts collected in Federal automotive excise taxes.

## The Two Major Issues

THIS brings us down to two fundamental questions involved in any intelligent approach to the problem of equitable allocation of highway cost.

First: What share of total highway and street costs properly is chargeable to motor vehicle owners as an overall group, as distinguished from other highway beneficiaries?

Second: How should the portion of cost properly assignable to motor vehicles be distributed among the different types of motor vehicles?

The first question can be the subject of a great deal of controversy and a wide variety of opinions. One's judgment on this phase of the matter alone, whether it be objective or biased, can make the difference between a conclusion that motor vehicle owners are subsidized or pay more than their fair share.

The divergency of views on this question is illustrated by the accompanying table (Fig. 2) showing "percentages of responsibility for road and street costs assigned to motor vehicles by various investigators."

You will notice from the table that in approaching the question it is necessary to classify the highways since everyone recognizes that motor vehicle responsibility varies according to the type of facility involved.

All of these investigators assigned to motor vehicles the bulk of the cost of primary highways. But when we get into the question of secondary roads (second column), and city



## HOW MUCH SHOULD USERS PAY?

Study	Percent of Responsibility for		
	Primary Highways	Secondary Roads	City Streets
Board of Investigation & Research (U. S.)	85%	30%	40%
Federal Coordinator (Eastman Report - U. S.)	83	34	30
Ennis (New Jersey)	85	85	51
Duncan (U. S.)	82	82	25
Glover (Illinois)	90	60	50
Oregon Highway Commission	81	11	19
A.A.R. Report (Breed, Older & Downs, U. S.)	91	91	48
Allen (Iowa)	100	44	73
New Mexico	100	30	15
Utah	90	60	50
Griffenhagen (New York)	100	60	*

Eleven studies produced as many answers to question of percentage of road cost to be borne by highway users

## UNDER TON-MILE THEORY . . . .

	PASSENGER CAR (9,500 miles)	TRUCK 40,000 lbs. (45,000 miles)
REGISTRATION FEE	\$ 10.00	\$195.00
GASOLINE TAX	28.80	450.00
GROSS RECEIPTS TAX	—	160.00
TOTAL TAXES	\$ 38.80	\$805.00
TAX PER 100 VEHICLE MILES	\$ 0.41	\$ 1.79
TAX PER 100 TON-MILES	0.25	0.12
EQUALIZATION	INCREASE TRUCK TAXES MORE THAN 100% FROM \$805.00 to \$1,629.75	

. . . heavy truck taxes in many states would be more than doubled as illustrated in typical example, shown above. For fallacy of ton-mile theory see chart at right.



## OPERATING COST THEORY

	PASSENGER CAR (9,500 miles)	TRUCK 40,000 lbs. (45,000 miles)
TAXES AT PRESENT RATES	\$38.80	\$ 805.00
OPERATING COST THEORY	38.80	1,102.00 UP 37%
TON-MILE THEORY	38.80	1,630.00 UP 102%

Above. This plan is based on "value received"; has no relation at all to highway needs or possible damage

Right. 20-year old chart from BPR shows pavements required and still relative (though outmoded) costs

streets (third column), we find a much greater difference of opinion.

Some of these investigators found that motor vehicle owners as a whole were paying substantially more than their fair share of road and street costs. Outstanding in this category was the study of the late Federal Coordinator of Transportation Joseph B. Eastman, who assigned motor vehicle owners 83 per cent of the cost of primary highways; 34 per cent of the cost of secondary roads, and 30 per cent of the cost of city streets.

On the other hand, a couple of the investigators found motor vehicle (TURN TO PAGE 174, PLEASE)

## INCREMENTAL THEORY IS BASED ON LOADS

Gross load of vehicle	Static wheel load	Approx. Average	Initial cost per mile
Pounds	Pounds	Inches	
Passenger cars	- 1,750	5 1/2	\$ 31,800
Trucks 5,000	1,900	5 1/2	
7,000	2,600	5 1/2	
11,000	4,100	6 1/8	33,300
13,000	4,900	6 3/8	33,900
18,000	6,800	7	35,400
22,000	8,300	7 1/2	36,600
25,000	9,400	7 3/4	37,200
26,000	9,750	7 7/8	37,500

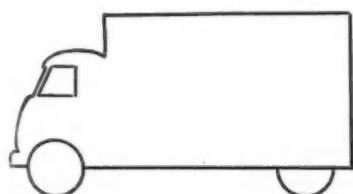
## COMPONENTS COSTS OF ROAD CONSTRUCTION

ITEMS OF ORIGINAL COST	AMOUNT	PERCENT OF TOTAL COST
RIGHT-OF-WAY	\$ 559,730,000	9.4
GRADING	1,235,255,000	20.8
MINOR DRAINAGE	503,268,000	8.5
LANDSCAPING	234,018,000	4.0
BRIDGES	1,561,154,000	26.1
CURBING, SIGNS & MARKERS	41,846,000	0.7
SURFACING	1,816,208,000	30.5
TOTAL COSTS	5,951,479,000	100.0
AVERAGE COST PER MILE - \$425,000		

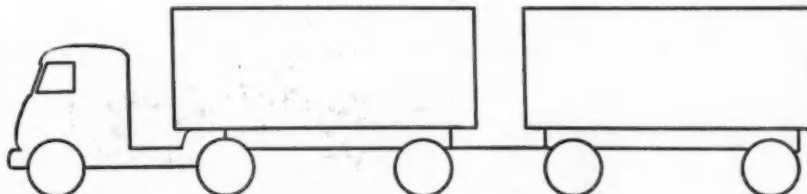
Here are actual costs for four lane highway in Virginia. Surfacing amounted to 30.5 per cent

## TON-MILE TAX HAS NO RELATION TO HIGHWAY COSTS

Same type of highway construction would be needed for both of these vehicles



6,000 lbs. 20,000 lbs.  
GROSS WEIGHT - 26,000 lbs.



6,000 lbs. 20,000 lbs. 20,000 lbs. 20,000 lbs.  
GROSS WEIGHT - 86,000 lbs.

Obviously smaller truck at left puts just as much critical weight on highway as larger unit. Yet under ton-mile theory, larger unit would pay 3 1/2 times more



## 100 AMP AC-DC Charge Meter

**T**HE problem—a need for an accurate charge meter for trucks with a 100 amp rectified AC charging system. The purpose—to diagnose quickly and accurately any defective unit in the system.

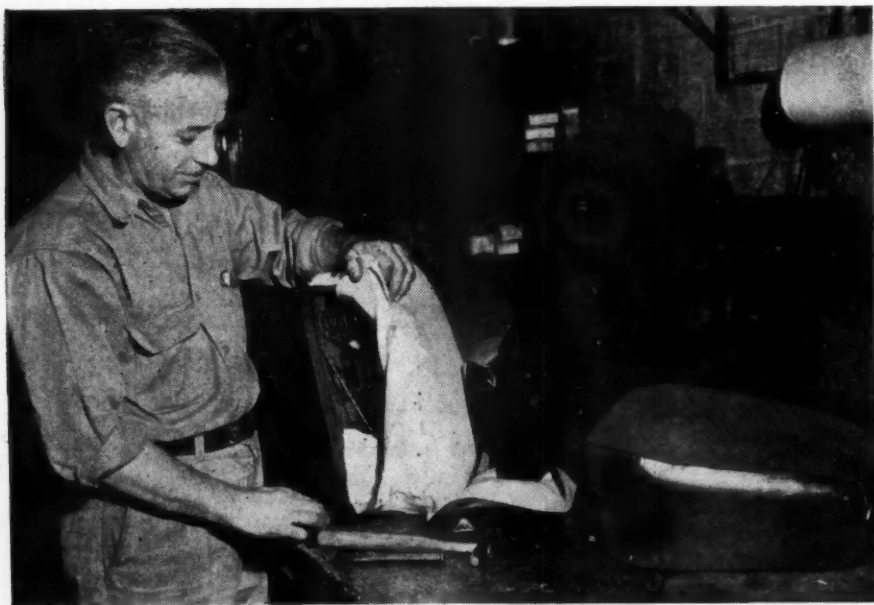
The combination 100 Amp AC-DC Charge meter consists of a precision 0 to 20 voltmeter, a 100 Amp ammeter, a knife switch in the ammeter circuit, a small switch for energizing the alternator field, and a light over the circuit. There are two No. 8 wires for the charging circuit, and a No. 14 wire for energizing the field. The meter assembly fits on the seat frame and grounds out.

The meter is connected in series with the charging circuit between the rectifier and the batteries. The meter field lead to the alternator field is taken off the voltage regulator. This will allow the alternator and rectifier to charge maximum. It should be 100 Amps at approximately 1700 rpm.

Then the alternator field is connected back to the voltage regulator and a check is made for proper voltage setting. With batteries in good condition, the voltage will start to build up at approximately 900 rpm and gradually build to 14.6 volts and drop back to 14 volts as the speed is increased, indicating an efficient charging system.

# Practical Shop Hints

These five tips save maintenance time, cut PM costs for Consolidated Freightways



## A More Comfortable Seat

**T**HE Problem—uncomfortable drivers' seats—

Harold Knighton takes the regular driver's chair seat, inserts a piece of 3/16-in. plywood which is hog-rung to the spring assembly, and cements a 3-in. layer of foam rubber to the top of the plywood, then replaces the cover.

Some of these rebuilt seats have been in use for more than 250,000 miles without coming back for repairs or rebuilding. Knighton says that around 150,000 miles is average for a conventional drivers chair seat.

Having only the up and down spring, the driver gains the full shock relieving advantage without sliding. Result is less driver fatigue.

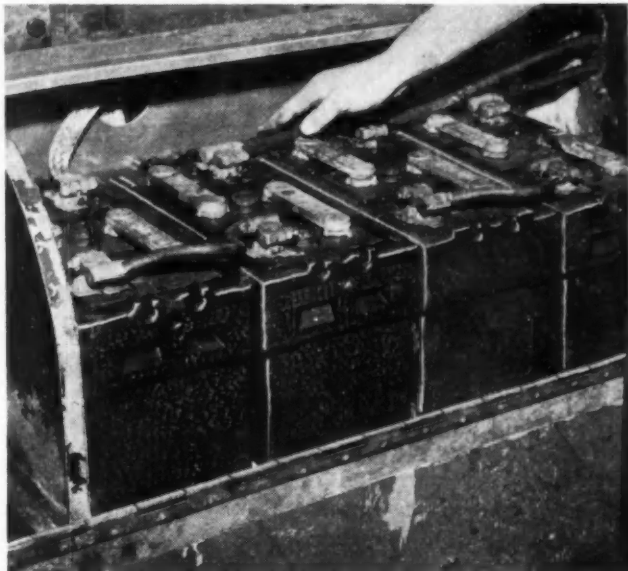


## Leaf Spring Salvage

**T**HE Problem—wear at the end of the top leaf of rear truck springs. The spring rides on an equalizer at this point causing the excess wear.

In order to keep from having to replace an entire leaf because of wear at the end, a 4 by 6 in. tapered section the same thickness as the spring leaf was spot welded on to the end of the spring.

It was found that the wear plates lasted as long as a new spring leaf. When the wear plate becomes worn it is burned off and a new plate spot welded on.



## from Consolidated

These improvements cost little



## Battery Wire Modification

**T**HE problem—Five feet of excessive battery cable. For years the conventional battery hookup was to place the four batteries lengthwise in pairs, end to end the battery box attached to the side of the frame behind the cab.

This hookup necessitated an extra removal when a rear battery had to be replaced or removed for servicing. This hookup required a long section of battery cable from the positive terminal to the starter switch on the equipment.

The new straight-line hookup developed, as shown consists of cutting down the size of the battery box and placing the four batteries crosswise instead of lengthwise. This saves five feet of battery cable.

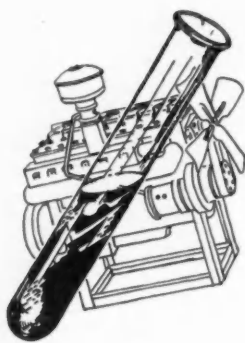
## Device for Removing Energy Cells

**T**HE problem—Lost time in energy cell removal. This home-made air or energy cell puller for the Buda-Lanova type combustion system operates on a knocker principle. The lower end of the tool slides into a slot between two bolts screwed into the air cell plug. The hammer is operated and the cell plug is removed.

The bolt end of the puller is then removed and the end of the tool turned around and screwed into the energy cell thread. After this is done the knocker is used to remove the energy cell.

This tool save approximately 45 min time in the procedure.





# Additive Oils

## Cut Deposits, Wear Rate

**I**N GENERAL, improvement in operation from fuels and lubricants in field service can be divided into two categories—reduction of wear and deposits in high and low temperature operating conditions. Wear is more prevalent in low temperature than in high temperature operation and will be discussed later.

High temperature deposits have as their origin the oxidation of engine lubricating oil. Corrosion of alloy type bearings can also be the result of high temperature oxidation of the lubricating oil. Low temperature deposits are not the result of oxidation of the lubricating oil, but are the result of the contamination of the lubricating oil with products from the combustion chamber.

TYPE OF OPERATION	NATURE OF ENGINE DEPOSITS	EFFECT OF ENGINE DEPOSITS
High Temperature (Heavy load, high speed, long-hop operation)	Varnish and lacquer Coffee grounds (coke-like carbon)	Stuck rings Stuck wrist pins Stuck valve lifters Stuck valves Plugged oil screens

With regard to high temperature deposits, they occur as a result of oxidation of the engine lubricating oil. The nature of such deposits are generally a varnish or lacquer-like material or coffee-ground sludge. The effect of these deposits is to produce stuck compression rings, stuck wrist pins, stuck valves, stuck valve lifters, and in some cases plugged oil screens.

There are two theories as to the formation of coffee-ground sludge. One is that it is formed by the lubricating oil which is splashed onto the underneath side of the piston and there oxidizing and carbonizing and

falling back into the crankcase in relatively small granular particle size. The second theory is that it is formed when fresh unoxidized oil is put as make-up oil into a crankcase containing used partially-oxidized oil and that some of the oxidized oil molecules are insoluble in fresh oil and are precipitated in relatively small granular particle size, producing so-called coffee-ground sludge.

In many cases where bearing failures are reported in the field, the first reaction appears to be that the oil has corroded the bearing. Babbitt bearings and Mordane bearings cannot be corroded. Copper-lead and cadmium-silver bearings can be corroded if the oil being used to lubricate the bearings is such that corrosive organic acids are formed. Visual examination in the field of a failed bearing cannot determine whether corrosion caused the failure. The only positive way to determine bearing

corrosion is to have the laboratory cut through the failed area, etch, and examine it under the microscope.

This time might be opportune to mention how lubricating oil, regardless of type, can effect bearing failure. There are only three ways in which lubricating oil can contribute to bearing failure:

1. If it is corrosive.
2. If it is dirty.
3. If it does not get to the bearing in sufficient quantities.

The oil contributes in this third factor only to the extent that it may be of too light viscosity or body to allow the oil pump to maintain the proper pressure or if clearances of the bearing are on the high side, it is thrown out of the bearing too rapidly and does not permit the bearing to form the wedge which gives fluid film lubrication in journal type bearings.

(TURN TO PAGE 58, PLEASE)

**Engineer outlines sources of deposits and their effects on engine operation in both high and low temperature operation . . . recommends high additive oils to reduce wear, rust and deposits**

**By William Howe\***

Chief Fuels and Lubricants Engineer  
Bus and Truck Section, Gulf Oil Corp.

\* Excerpted from a paper presented at the ATA Spring Meeting, Columbus, May 12-16.

Symbol	General	Specific	LUBRICATING OIL RECOMMENDED
Service MS Service DG	1. Gasoline and Diesel engines in light load, low temperature operation where fuel oxidation deposits, excessive fuel soot, sludge, and wear may occur. 2. For gasoline and Diesel engines in high speed, high temperature over-the-road, heavy load operation. For Diesel and gasoline engines in city bus operation.	1. All types of delivery fleets, such as truck delivery, bakery fleets, dairy fleets, etc. 2. For gasoline and Diesel engines in trucks and buses operating over-the-highway under heavy load. Also Diesel engines in intermittent as well as over-the-road service where special problems of fuel and wear may be encountered.	1. Supplemental 1* 2. MIL-O-2104 2-104B Supplemental 1*
Service MM	High temperature, light duty engines	Trucks at high speed over-the-road service carrying light loads. Passenger cars in high speed over-the-road service.	Premium Mild Detergent
Service ML	Moderate speed driving with no severe high or low engine temperatures or high or low load conditions.	Practically a non-existent type of service. However, includes possibly older engines, engines in poor condition, etc.	Mineral oil with no additives.
Service DS	1. For Diesel engines in low temperature service where fuel oxidation deposits, excessive fuel soot and sludge and wear may occur. For Diesel engines operating on medium to high sulfur fuel. 2. For Diesel engines operating on high sulfur fuel, for certain high output or super-charged Diesel engines.	1. Intermittent stop-and-go operation of Diesel engines. Excessive use of throttle, such as in city bus operation and city delivery service 2. For certain makes of Diesel engines which due to high output or super-charging, the manufacturer recommends a Supplemental 2 (Series 2) oil. For certain Diesel engines which must operate on Diesel fuel having sulfur content ranging from 0.4% to more than 1.0%	1. Supplemental 1* 2. Supplemental 2* (Caterpillar Series 2)
*Obsolete			

Fig. 1. The author's interpretation of the type of oils that will be offered against the new A.P.I. service designations.

Consultation with the petroleum supplier as to the proper type of oil for the service is recommended

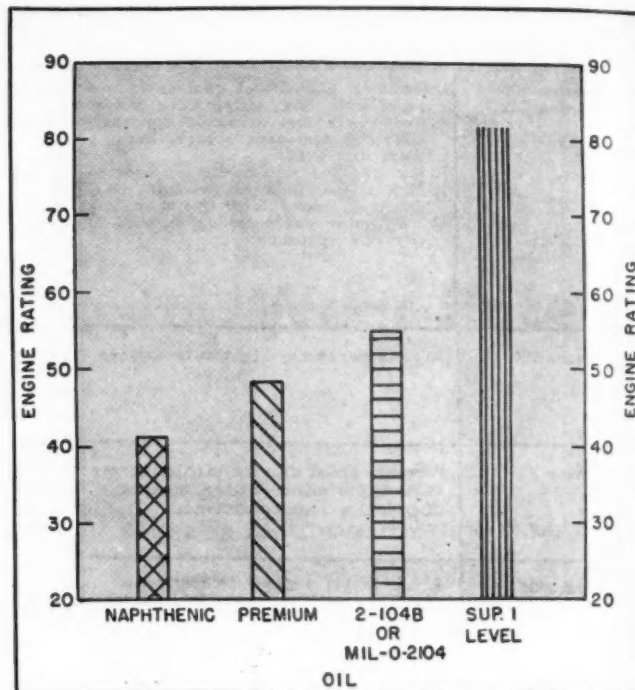
Fig. 2. Chart shows by symbol, general and specific service, lubricating oil recommendations under the new service symbols. In some types of service one or more oils may be satisfactory depending upon severity.

Symbol	Military	Prior A.P.I. and Other	SERVICE CHARACTERISTICS	GENERAL BASIC CHARACTERISTICS
Service MS	2-104B* MIL-O-2104 Supplemental 1*	Heavy Duty	1. Start and stop service which can result in corrosive wear, oil ring plugging, mayonnaise type sludge, and fuel varnish deposits. 2. High temperature, over-the-road, heavy load operation.	Contains oxidation and bearing corrosion inhibitors plus effective quantities of detergent-dispersant agents.
Service MM		Mild Detergent Premium	High speeds, heavy or light loads, where bearing corrosion and ring sticking may not be a problem.	Contains oxidation and bearing corrosion inhibitors.
Service ML		Regular	Moderate speed driving at no severe high or low engine temperature operation (practically a non-existent service condition)	Straight mineral oil containing no additives.
Service DG	2-104B* MIL-O-2104 Supplemental 1*	Heavy Duty	1. Diesel engines in over-the-road service using relatively low sulfur fuels. 2. Diesel engines in city bus operation where excessive fuel soot and heavy ends of the fuel do not contaminate the crankcase oil.	Contains oxidation and bearing corrosion inhibitors plus effective quantities of detergent agent.
Service DS	Supplemental 1* Supplemental 2*	Heavy Duty Caterpillar Series 2	1. For Diesel engines in low temperature service which might result in fuel oxidation deposits, excessive fuel soot, and mayonnaise type sludge as well as corrosive action from too low crankcase and cylinder wall temperatures. For certain Diesel engines using high sulfur fuel. 2. For certain super-charged Diesel engines and high output Diesel engines.	High additive oils containing oxidation and/or bearing corrosion inhibitors plus detergent-dispersant additive level equivalent to the Supplemental 1 or Supplemental 2 oils.
*Obsolete				



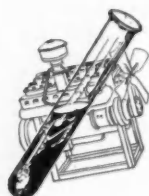
Fig. 3. Chevrolet parts from an engine after 5100 miles of over-the-road service, using heavy duty oil. Condition shows that specification does not always guarantee service

Fig. 4. Bar graph compares four oils after 30,000-mile test period. Superiority of Supplemental 1 level oil is clearly shown. Higher concentrations of additive did not appear to be any more effective than Supplemental 1



## Additive Oils . . .

Continued from Page 57



In spite of the engine tests to determine whether an oil will or will not produce high temperature deposits, there are a number of oils which will pass the L-4 procedure and the Caterpillar L-1 test in a satisfactory manner, but will not perform with equal satisfaction in the field. It must be remembered that any specification is a minimum quality line. It does not guarantee that one oil will not be better than another. Figure 3 shows Chevrolet parts from an engine used in over-the-road service. At the time this picture was taken, this engine had travelled 5100 miles on an approved heavy-duty type oil. This was a good 2-104B oil. Considering the appearance of this engine at the end of 5100 miles, it is doubtful if it could have been operated for an additional 5100 miles without some engine malfunction occurring. Another approved heavy-

duty oil was also used in this particular operation and approximately the same results were obtained. On both of these oils after 1500 miles of operation the used oil analysis revealed that the viscosity had increased due to oxidation from that of an SAE 20 to that of an SAE 50 oil. When a third 2-104B approved heavy-duty oil was used in this operation, analysis of the used oil after 1500 miles of service also showed an increase in viscosity, but in this case only one-half of an SAE grade.

The third heavy-duty oil used, and which was relatively satisfactory, passed all the requirements of the new MIL-O-2104 requirement without any additional concentration of additive. It is known that one of the two other oils required additional concentrations of heavy-duty additive to pass the new military requirement, and based on service such as shown, it is quite possible that the second 2-104B oil also required additional detergent-dispersant additive to qualify under the new military requirement.

The fundamental reason why light-duty operation produces deposits and wear is that the temperature of the crankcase and cylinder walls is too low. The temperature indicated by

LOW TEMPERATURE OPERATION		
TYPE OF OPERATION	NATURE OF ENGINE DEPOSITS	EFFECT OF ENGINE DEPOSITS
Low Temperature (Light load, low speed, short-hop operation)	Mayonnaise-type sludge Varnish Fuel Soot	Rusted valve springs, timing gears, chains Plugged oil screens Plugged rings and oil screens Piston varnish Stuck valves and lifters Rocker shaft varnish

the thermometer on the dashboard is all too frequently not a true indication of the temperature of the cylinder walls and the crankcase. Due to the presence of a thermostat, it only takes a few city blocks for the water in the cylinder head to become hot enough to give a satisfactory reading on the dashboard indicator, and this is misleading.

In intermittent, light-duty service, the engine does not completely warm up, although the operator of the vehicle is not aware of this. If the cylinder wall temperature does not reach at least 140 deg F, water and inorganic acids from the combustion process will form, and rust or acid corrosion will occur. If the crankcase oil temperature does not reach at least 140 deg F, excessive dilution, and in many instances water, will remain in the crankcase oil. For every gallon of gasoline burned in an engine, there is approximately one gallon of water formed in the combustion



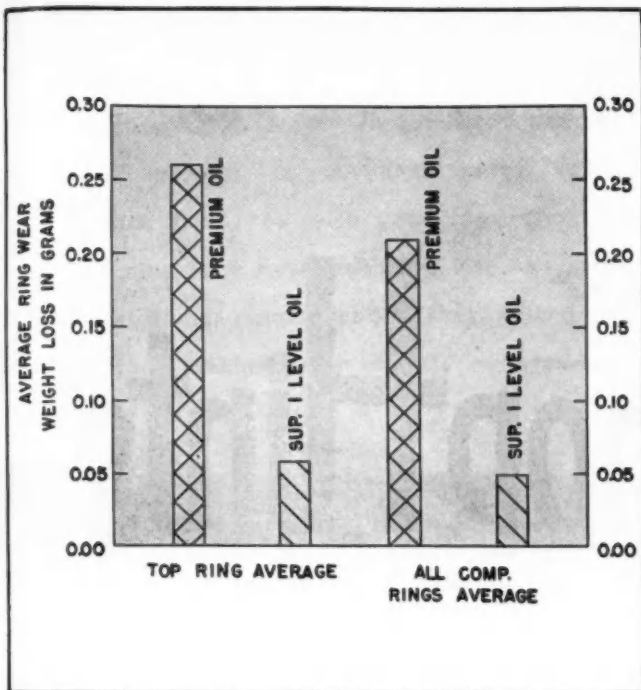


Fig. 5. Left. Laboratory cold room engine corrosion test data shows that Supplemental 1 level oil gives about 20% of the wear that is obtained with Premium type

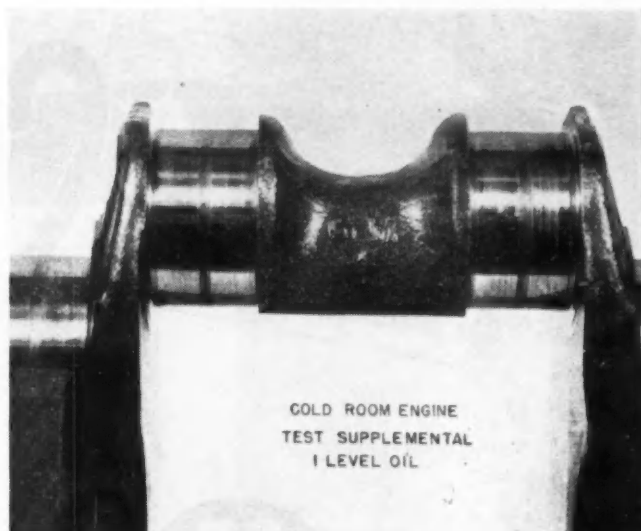


Fig. 6. Below. A section of crankshaft operated in an engine with a Premium oil. Fig. 7. Above. A crankshaft operated in a test engine with Supplemental 1. High additive oils tend to overcome acid action and thus reduce wear

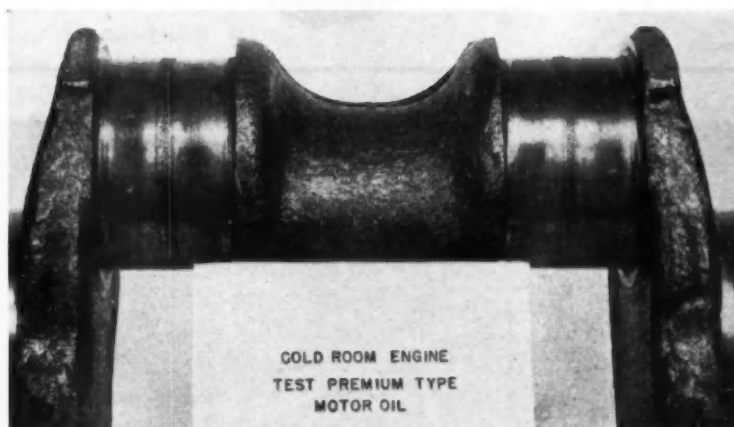
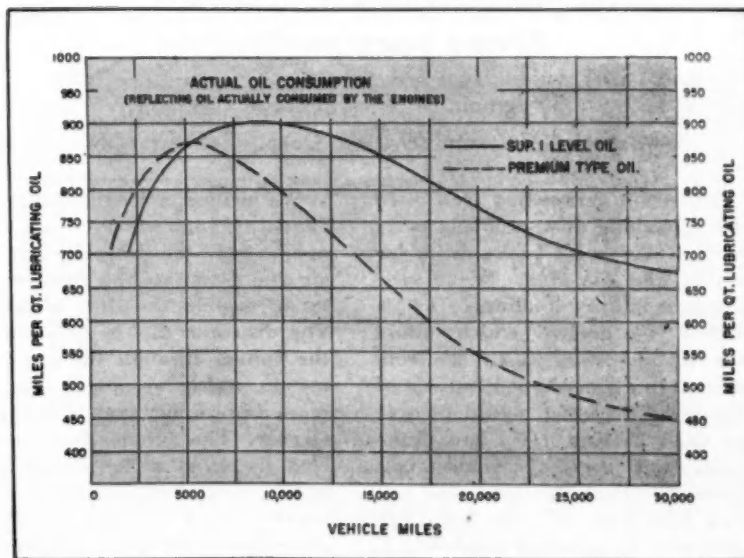


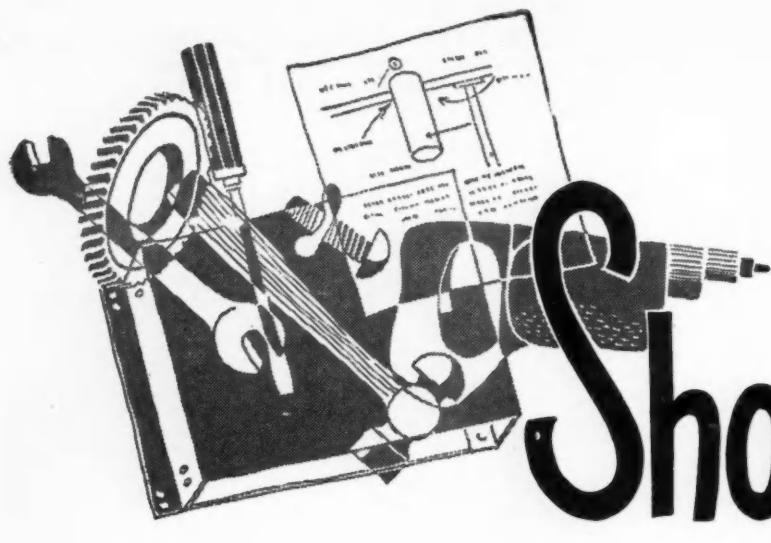
Fig. 8. Results of field tests of 30,000-mile duration on engines using Supplemental 1 and Premium oil. Oil consumption was not excessive with the high additive oil; became increasingly better with Sup. 1 as the mileage accumulated



process. This water and dilution is driven by the piston rings into the crankcase oil.

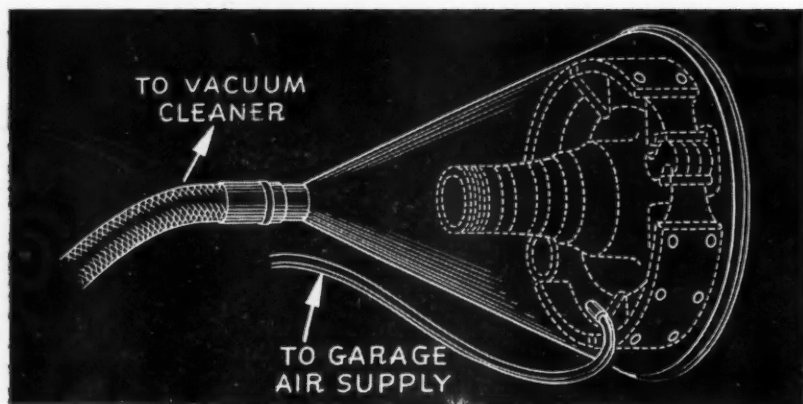
As additive concentration increases, the engine rating goes up. With one type of additive the improvement in engine rating is spectacular. With the other, it may be seen that the improvement in engine rating is more gradual. As additional heavy-duty additive is used, engine rating improves considerably with each increment of additive compounded with the lubricating oil. However, in field tests under actual operating conditions where the engines are rated in the same manner as in the laboratory, and by the same personnel, there appears to be a plateau of additive concentration which must be reached before any appreciable effect on engine deposits can be observed. In other words, up to a certain concentration of heavy-duty additive any lesser amount appears to be ineffective in minimizing engine deposits and sludge. Based on field test work, it appears that the concentration of detergent-dispersant and from this bar graph, the superior-heavy-duty oil is only mildly effective in this light load operation.

Fig. 4 is a bar graph showing the comparison of four oils at the end of the 30,000-mile test period. From the representative pictures of engine parts and from this bar graph, the superiority of the Supplemental 1 level oil is (TURN TO PAGE 158, PLEASE)



# Shop Hints

## HINT OF \$25 THE MONTH



### Brake Vacuum Cleaner

by Jemain M. Titus, Garage Foreman  
Rochester Gas and Electric Corp., Rochester, N. Y.

Our repair garage had been faced with a serious dust problem every time we removed a brake drum for service and cleaning. We finally overcame this condition by a method we devised which would take up the shoe dust. We constructed two cone-shaped funnels of galvanized tin which would fit over the axle, bearing races and brake shoes, and could be held tight against the backing plate. The two sizes take care of our fleet, but more may be added if needed.

We drilled a small hole in the funnel through which we run a hose nozzle from the garage compressed-air line to agitate the dust accumulation around the shoe assemblies. The dust and dirt is drawn out of the funnel through the end opening to which we attach the hose from an ordinary tank-type vacuum cleaner. The agitator hose is operated by using a shop-made valve, trigger controlled, which may be extended like a telescope any length desired into the nozzle opening.

### 1. Tailgate Cushion

by Ed Brodsky  
Prairie Motor Truck Service, Inc.  
Chicago, Ill.

To protect rear corners of the truck body, a simple, smash-proof bumper can be made from a junk tire. Cut a length of the tread portion about 10 in. long and trim off the sidewalls. Bolt short lengths of  $\frac{1}{4}$ -in. chain to one end of the bumper, using large washers on each side of the bolt to prevent it from being pulled through the rubber. The other end of the chain can either be bolted or welded to the end of the body post. This type of flexible mounting will prevent the bumper from being sheared off when the truck backs into a dock at an angle.

### 2. Pipe Trailer Flaps

by Paul Rogers  
Ohio Fuel Gas Co., Columbus, Ohio

Compliance with mud-flap laws when they involve a tiny pole or pipe trailer was accomplished here recently when we rigged some home-made flaps that are removable, yet comply with the law. We took a section of 1-in. heavy-duty pipe and another piece about twice that length. We cut a hole in the C-shaped pole support and butt welded the 36-in. piece to the center of the frame. We tacked the pipe to the C-frame where it came through so that it would be solid. We did this on both sides. The rear pipe, as shown, was recess welded to the side frame and center angle respectively.

CCJ pays **\$10** for each shop hint published; **\$25** for what editors consider exceptional. Is your name here? Let us hear from you with your suggestion for a new tool, new technique, shop-designed or home-made gadget that will assist other mechanics in vehicle maintenance.

## FROM FLEET SHOPS

This completed, we selected two pieces of 1½-in. light-weight pipe, 29½ in. long and welded them to each end of a piece of checker plate 26½ in. wide and 31 in. long, after the rear end of the plate had been turned to a 106-deg angle. This lip we drilled for attachment of the flap which measured 24 in. by 30 in. When the flaps are needed, they are slipped over the frame pipes and held in place by a safety chain. The chain is attached to a ring.

### 3. Hydraulic Press

by I. L. Benton, Shop Foreman  
Seashore Transportation Co., Inc.  
New Bern, N. C.

We wanted a hydraulic press, so we made our own from a few pieces of iron and some scrap. We have found it to be a very handy addition to our shop equipment in doing small press jobs quickly and efficiently. All that is needed to assemble one, is about 12 ft of 4-in. channel iron, an upright hydraulic jack (8-ton), and a few pieces of other scrap usually found around a repair shop.

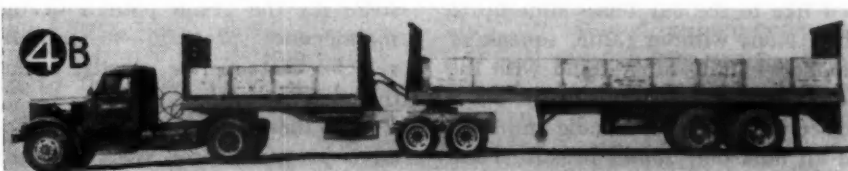
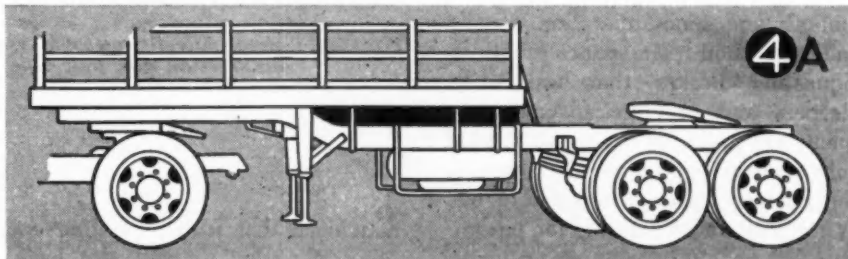
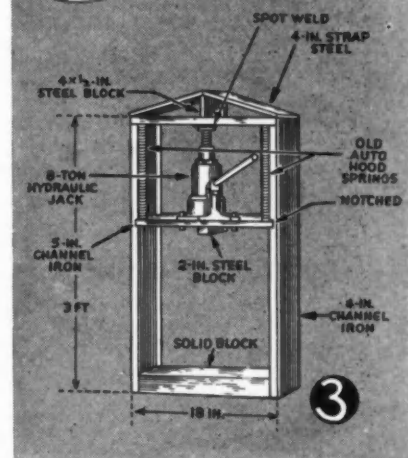
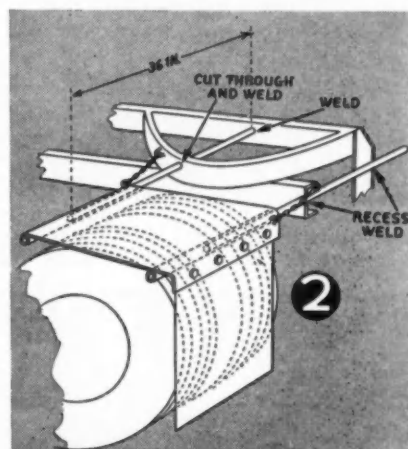
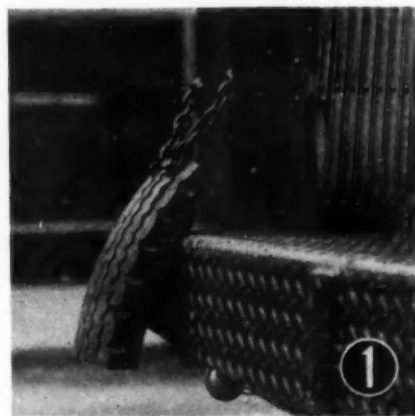
The 4-in. channel is welded into a square, with the base filled solid with concrete. The top is reinforced by a 4-in. strap as shown. The jack is bolted upright to the sliding bar, and the screw top placed tight against the top of the frame. It is held in this position by two scrap hood-springs tacked to the bar and the upper cross member of the frame. To place the work, a 2-in. steel block is welded below the sliding bar.

### 4. Trailer Boosts Payload

by Martin G. Hall  
Keeney Truck Lines, Los Angeles, Calif.

We built up a semi-trailer train unit out of one of our old trailers, enabling us to haul 25-ton payload without fear of overloading. The unit pulls and handles well, is easier to hook up than a set of doubles and can be broken down and hauled as a semi.

The construction principles are adaptable to the size of the trailer you intend to convert. We cut the original body at a point 12 ft to the rear of the forward edge of the fifth wheel plate. The body supports were cut at the same point. A slight indentation was cut from the frame, and a cross-member support for the second fifth wheel was welded into place.





# Better Brake Work

## Doubles Drum Life



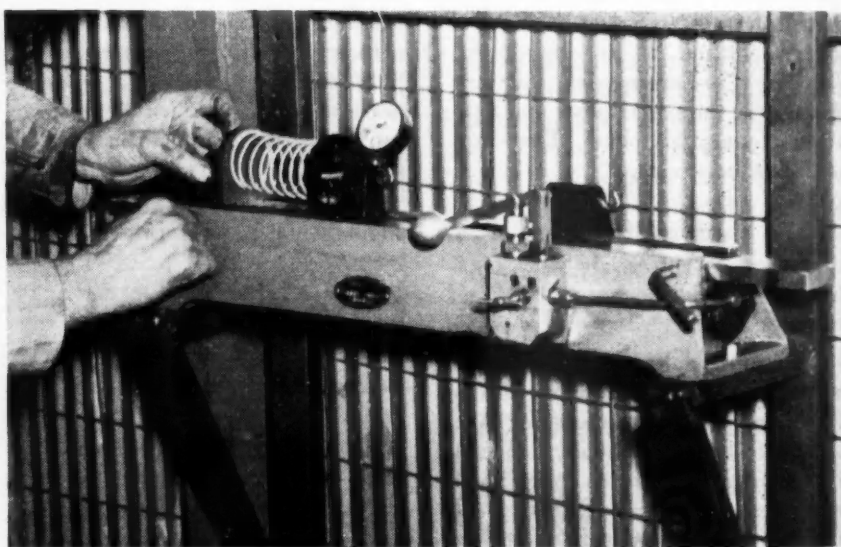
**Noise reflects high PM costs. Extra attention to balance, adjustment, drum-to-lining contact improves stopping ability, ups drum life by 50%**



**By W. O. Hesson**  
Supt. of Transportation  
Springfield Transportation Co.  
Springfield, Ill.

**V** EVEN if smoothly running buses were not good public relations, smooth and quiet operation usually indicates good maintenance practices. Squealing brakes that wake day sleepers and generate adverse comments are probably not doing a good job of braking, either. Conversely, the noisy, rattling, rough-riding bus is not only uncomfortable for passengers but usually is running up maintenance costs at the same time.

I like to see our buses slide up to their stops without rattle, squeak or smoke. I quite often stand with the others at bus stops and ride the buses to see just how they handle and most of all how they *sound* because I am



*Horizontal hydraulically-operated spring testing machine used in testing both compression and pull type springs for brake and valve work*

convinced that with maximum operating efficiency we will also have a low noise level. This theme sets the stage for the grand pattern of our maintenance program—to produce vehicles that operate quietly, brakes that don't squeal or grab.

With these objectives we embarked on a program three years ago and

have turned up some surprising results. For instance when we got our brakes operating so drivers could make velvet stops, we found we had doubled the life of our brake lining and stretched the life expectancy of our brake drums almost to infinity. All this and good public relations, too.



*Brake drum lathe is set up to turn down a drum. Careful supervision of this work increases drum life by 50%*



*Amount of metal removed is stenciled on drum rims for guidance of the mechanic when future cuts are made*



*Brake drums are carefully measured and a check for out-of-roundness is made (even new drums) before use*



*Two of the twin post lifts used in brake inspection and maintenance. Lifts replace pits, provide convenience and space*

In the beginning of our brake program we discovered that while the hydraulic brake was no doubt unequalled in obtaining even application of brake shoes on all four wheels, the springs did not lift the shoes at the same time or at the same rate when brakes were released.

Some of the noise, squeak and

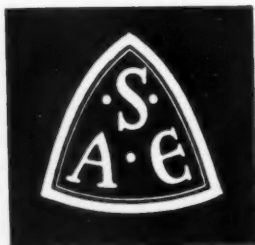
erratic behavior was due to the springs being of unequal length and of unequal tension. Some shoes remained in contact with the drum a little longer under slight pressure, some shoes were first cleared of contact by the revolution of the drum and other shoes with stronger springs snapped back.

We decided to test and match our springs and for this purpose installed a horizontal hydraulically-operated spring testing and matching machine which can be used on both compression type and pull type springs. With this machine in use we inaugurated a program of testing all our springs and

(TURN TO PAGE 119, PLEASE)

# How—Why—Where—ENGINES WEAR

**V** ENGINE wear is now the major factor limiting engine life. Based on the experience of the Esso Laboratories, it is believed that this wear is mainly due to friction and abrasion between the rubbing surfaces. This frictional and abrasive wear between piston rings and cylinder walls increases engine clearances to the point where the oil consumption of the engine finally becomes excessive. The engine must then be overhauled. Prolonged engine life can be realized through the development of lubricants which will reduce friction type wear.



Over a year ago a survey was made in the New York Metropolitan area to determine why engines are brought in for overhaul. What factors limit engine life? Fifty-seven per cent of the engines examined had been brought in solely because of excessive engine wear. These engines were relatively free of deposits and showed no evidence of mechanical failure. The wear was excessive. Median cylinder wear in these cars was .015. Thirty per cent of the cars actually had cylinder wear in excess of .020. The ring gaps (in a standard gage) were at least six times the manufacturers' recommended gap. In some instances the ring gaps exceeded .200 compared with the recommended gap of .010-.015. It is obvious that these engines had been brought in for overhaul because they were worn out.

Twenty per cent of the engines examined had both high wear and heavy deposits. In these instances, it was not possible to lay the blame solely on either the deposits or the wear. There was no way of knowing which was the primary cause of engine failure. In another 8 per cent of the engines, excessive wear was accompanied by some type of mechanical failure. All told, 85 per cent of the engines examined were excessively worn. Heavy deposits alone accounted for only 5 per cent of the failures.

The worn surfaces of the piston rings from the engines surveyed in the field were examined to see if anything could be learned about how the engines had worn. To get a basis for comparison, three special wear tests were run in a Lauson

**Seven-member SAE panel reviews causes of cylinder, ring, piston wear; suggests remedial measures for common troubles in fast moving technical symposium**

## Abrasion and Friction Cause Wear

L. E. Moody—Esso Laboratories

engine. One test was run under high temperature friction type conditions. In this test the jacket temperature was 180 deg F, and the engine was run for 800 hours. Another test was run under abrasive conditions. The test conditions were identical with those used in the first test, except that 0.5 per cent of 500 mesh carborundum was dispersed in the oil. The engine lasted five hours. The third test was run for 40 hours with the jacket temperature held at 60 deg F to promote low temperature corrosion.

It was found that a friction worn surface is relatively smooth, an abraded surface is heavily ridged, and a low temperature corroded surface is completely covered with pock marks and craters. In subsequent work it was found that if an engine had operated for even a short period of time under low temperature corrosive conditions, the resulting pock marks and craters are not erased even after 100 hours of operation under friction type conditions. The differences in the appearance of these worn surfaces provided a means of determining what type of wear had occurred in the field engines.

Replicas of the field rings were made and examined under the microscope in the same manner. It was found that, by far, the biggest proportion of the field engines appeared to





*A. F. Underwood, chairman of the engine wear symposium, introduces the seven-member panel. M. M. Roensch, secretary, looks on*

have worn by friction and abrasion. Ninety per cent of the surfaces examined appeared to have been worn by either friction or abrasion, or a combination of the two. What appeared to be low temperature corrosive wear was only observed in ten per cent of the engines. It was concluded from this experiment that most engine wear occurring in the field is due to friction and abrasion. The abrasive wear seems to be mild. Most of the wear rates compare with that for friction type wear.

Friction wear is much less severe than low temperature corrosive wear. For example, in laboratory engines, friction wear is at least an order of magnitude less severe than low temperature corrosive wear.

### Where Engines Wear

Victor G. Raviolo—Ford Motor Co.

In the past few years we have seen more and more attention given to a few special qualities of motor oils. Since there has been this concentration on one or two requirements to the exclusion of others, I propose that we re-examine the whole engine lubrication problems with an eye to fundamentals.

The first requirement of the oil is the ability to lubricate. Critical areas in all engines are the rocker arm and shaft, valves and guides, tappets and cams, fuel pump arm and eccentric, and oil pump drive gears. Although these differ

widely in lubricating method, in type of loading, and in possible metallurgical conditions, they all are subject to a common type of failure—a scuffing or galling of the surface with consequent mechanical abrasion.

As we know, these failures could also be solved by a change in the lubricant. Oil pump drive gears, for example, have been critical throughout the industry for many years. Perhaps the same ingenious lubricators who helped to solve the hypoid axle problem could also help to remove these from the critical category.

Another requirement of good lubrication is cooling. This is best exemplified in the lubrication of engine bearings. In this case, a small chamfer at the parting lines between upper and lower bearing halves provided additional channels for a greater flow of oil. Therefore, the success of the (undamaged) bearing, using the same lubricant, was due solely to the more efficient use of the lubricant's cooling properties.

Next, a good lubricant must combat corrosion. Here we mean the kind of corrosion that attacks valves and guides, cylinder walls, and timing chains. There is a considerable history of such failures in engines prior to their installation in vehicles. Many of our engines were built at one branch plant and shipped to another for installation. During the interim between shipment and installation, corrosion of the valves and/or guides led to this type of failure. In this case, the initial fill oil was changed from a stabilized mineral

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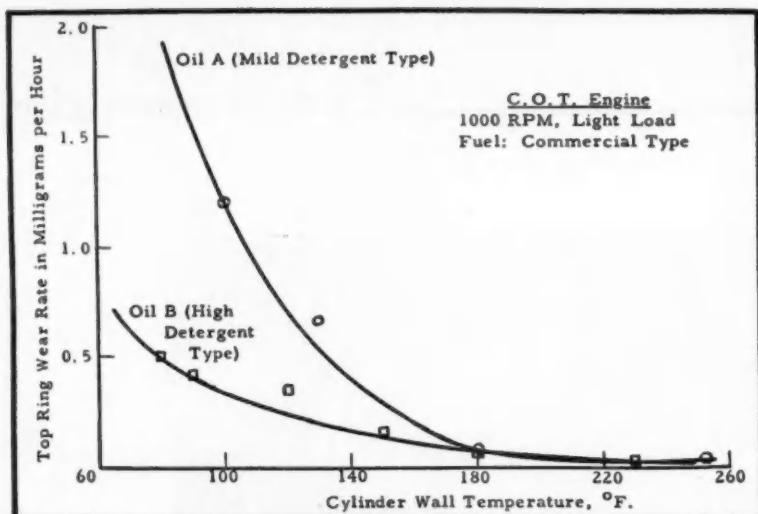


Fig. 1. Graph shows spread in wear between two oils under varying cylinder wall temperatures. Difference in wear are due to difference in corrosion protection of the oils, according to Mr. Jackson. See p. 152

## Engine Wear Symposium

Continued from Page 65

stock to what is substantially a Mil. 2-126 specification oil, and the problem was solved.

There is also the kind of corrosion which affects most of the unpainted and exposed metallic parts in an engine to a greater or lesser degree. This occurs primarily during temporary storage periods between operating schedules in the sense that it is caused by vapors which condense and are carried by the lubricating oil to these surfaces.

Factor number four is noise control. In this sense, the oil is used as a soft cushion between metallic parts to prevent excessive noise. Here, the problem is a fairly simple one, in that the lubricant need only be a viscous fluid to satisfy the requirement.

Now, we have spoken so far of the things which I call positive factors, the things which a lubricant *must* do, and I think we are ready to talk about negative factors, the things which the lubricant *must not* do. These are probably more familiar, since they are the ones which have been receiving the greater part of our attention.

First, the lubricant should not oxidize or decompose of itself. That is, it must withstand the mechanical and thermal conditions which exist in the engine without becoming itself a source of difficulty. It must not plug oil holes, or fill the clearance volume so that pieces are forced against each other with excessive pressure, or cause plain gummy sticking.

Second, the lubricant should not combine with other materials in the engine. For example, if it condenses in the crankcase, or combines with combustion by-products in the crankcase, it tends to form sludge. Nor must it combine with lead to form deleterious deposits in the combustion chambers.

Third among the negative qualities, the lubricant must not change in viscosity. Here we are referring primarily to the light oils which are made to meet, or to substitute for, the 5W specification. Obviously, if these oils change in viscosity, the engine operator cannot be sure of the starting condition.

### Alkaline Oils Cut Wear Rate 50% Ellis and Edgar—Shell Oil Co.

An estimate of the magnitude of cylinder wear is possible if those data presently on hand from field observations are inspected closely. Previous reports show that cylinder bore wear may average about 0.004 in. per 10,000 miles in intermittent service. If the average cylinder wear profile is assumed to be equivalent geometrically to that found in laboratory studies and if a few statistics of the automotive industry are used it may be shown that each year some 700 tons of iron ore are lost from the cylinder bores of American automotive engines. One bil-

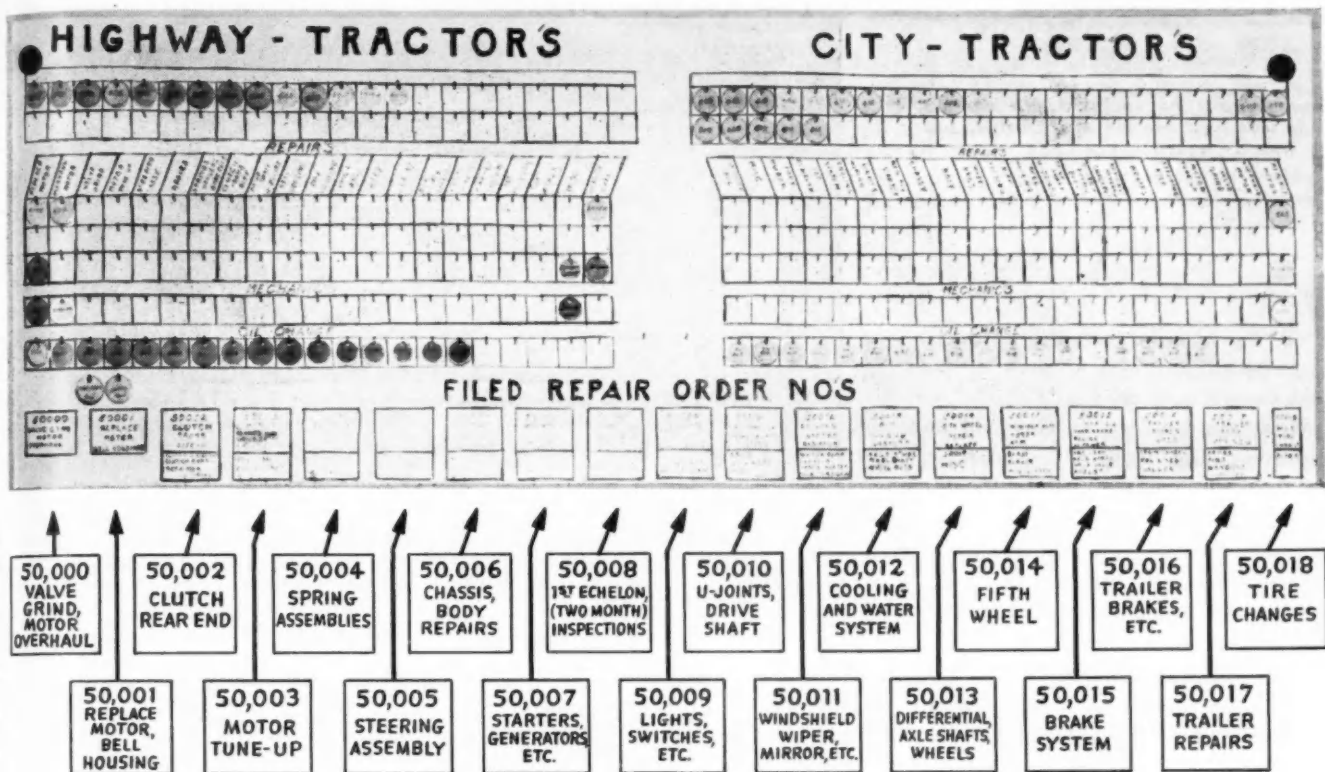
lion dollars a year is a conservative figure for the cost of this type of engine wear. Furthermore, based upon annual scrappage estimates, some 3,000,000 vehicles are discarded annually. Although it would be presumptuous to assume this number is entirely the result of cylinder wear great enough to preclude further reboring, certainly a large portion of these 3,000,000 engines are worn out cylinder-wise.

In general, wear may be classified as being either mechanical or chemical. Mechanical wear may result from the impact or impingement of a fluid on a solid which is erosion, or it may be the result of two solids moving in contact which is abrasion. Under all conditions of engine operation, abrasion will contribute to some portion of cylinder and ring wear. However, when oil filter and air cleaner maintenance is good and the atmosphere is clean, this abrasive wear will be negligible. Nevertheless, under these conditions wear can still occur, and this wear is chemical or corrosive. That is, wide fluctuations in cylinder wear may be caused by changes to operating conditions which can effect corrosion only, and if the greatest part of corrosive wear is so eliminated the remaining wear, which may be attributed to abrasion, is so small that it has no practical effect on the life of the engine. What, then, are the operating conditions which are conducive to this type of wear, and what action may be taken against it?

If attention is initially focused on field experience it is found that high rates of wear universally occur in light duty, intermittent, urban delivery type of service which is characterized by low operating temperatures, frequent stops and a high proportion of cold starts. This service is rendered exclusively by gasoline engine powered equipment. Corrosive wear is less pronounced in heavy duty service typified by long haul, highway transport usage in which engine operation is best matched to conditions giving low wear. Both gasoline and diesel powered equipment are found in this service. Heavy duty service can be high wear service in certain stationary engine installations in pumping and generating operations. This is particularly true when load factors are very high and operating temperatures are low. Stationary power plants may be gasoline or diesel, but wear is usually more severe in diesel engines where conditions may require the use of low quality fuels.

From a consideration of this very brief summary of operations, it would

(TURN TO PAGE 146, PLEASE)



# Control Board Tells Maintenance Story

Complete information on inspections, PM, lubrication is kept, conveniently arranged and easily read

IN THE GARAGE office at United Trucking Service, Detroit, a maintenance control board is used to give up-to-the-minute information on each of the 38 tractors in the fleet. Whenever called for, the information is available at a glance.

The board measures 4 ft by 18 in., is painted white, with all divisions and lettering in black. It is divided in half, a section for over-the-road units and a section for local delivery. Under these headings there are two rows of brads, 22 in a row, on which we hang white key tags with the tractor number on them. These tractors are ready for duty.

**By Frank Fary,** Garage Supt.  
Detroit Branch, United Trucking Service

When a tractor is in the shop for repairs, its tag is moved to a section headed "Repairs" which is also divided into over-the-road and local units. There are 19 subdivisions in the repair section, each representing a particular maintenance or repair job. We have divided our maintenance and repair program into this series of 19 operations, which consists of: replace engine, overhaul en-

gine, grind valves, tune up engine, steering assembly check, brake service, spring hanger and shackle overhaul, clutch repair and overhaul, transmission work, differential work, propeller shaft and U-joint operations, bell housing work, differential housing jobs, wheel bearing repacking and repairs, body work, chassis jobs, generator overhaul, regulator and cranking motor work, light service, cooling system checks and repairs.

Our inspection period is bi-monthly, when each unit is given an overall maintenance run.

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*Progressive type springs with contact pads will improve riding comfort, but usually weigh about 25% more*

▼ JUST how far can the operator go in modifying leaf springs in the field to suit increased axle loads?

What can be done in the field to improve riding qualities—or at least maintain the qualities originally designed into the springs?

What specific recommendations can you make with regard to maintenance that will increase leaf spring mileage? . . .

These are questions posed by CCJ editors at a recent meeting with a representative of the Leaf Spring Institute. Armed with these queries, Murray Fahnestock approached a battery of experts in the field, representing both spring makers and fleet operators and came back with the following reports. Because of differences of opinions, the names of the experts have been omitted, although they represent the thoughts of many of the best practical minds in the truck spring industry.

How much springs may be "heavy-ied up" is highly controversial, be-

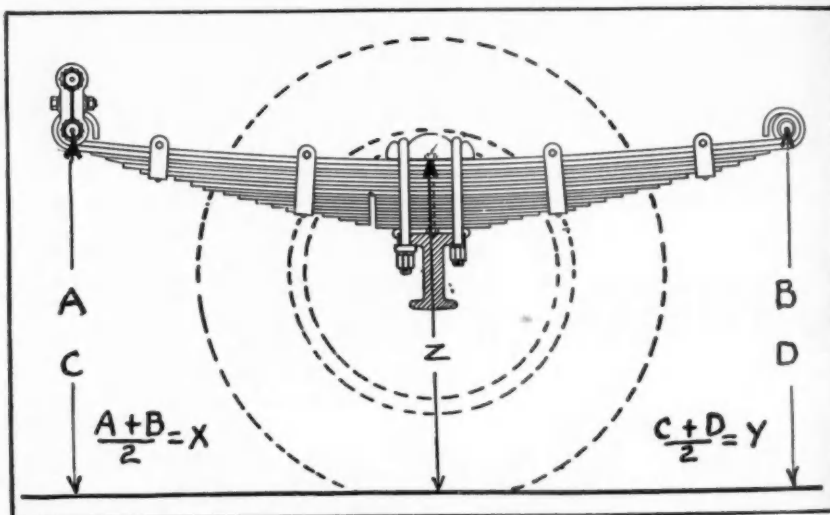
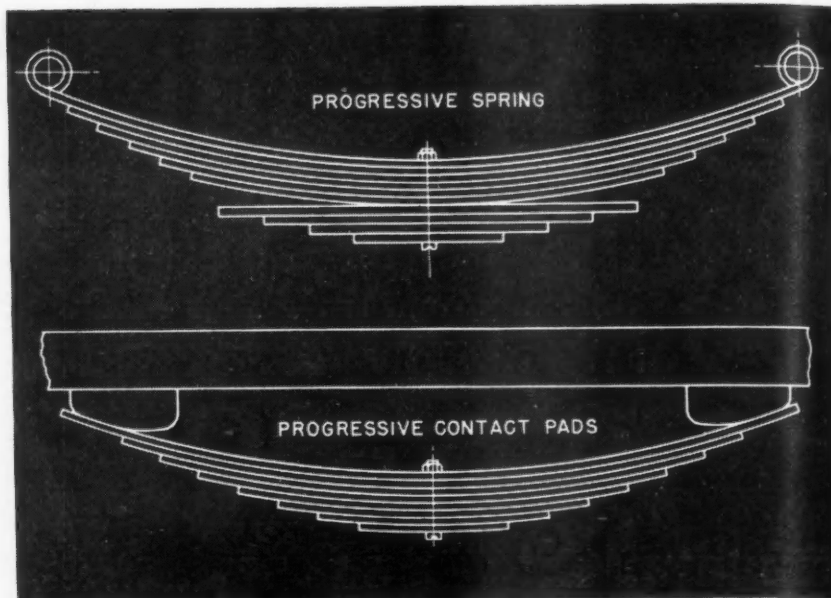


Fig. 3. A method for testing spring deflection empty and fully loaded. See text

## Experts Suggest—How to "Heavy-Up" Le

cause so many factors are involved to complicate the answer. One of these is that the conditions under which similar trucks operate are often quite different. That is why regular factory spring suspension equipment may often be changed to advantage.

For instance, what fleet operator hasn't seen trucks, of 1½-ton rated capacity, carrying as much as 10-ton loads over smooth highways? In such usage with low deflection, the

springs need only support the load.

But suppose this same overload is applied to a truck in farm or other off-the-highway use. Then, as the truck is driven over uneven land, the spring suspension parts and chassis frame are subjected to twists and bumps and perhaps the sudden application of brakes at the time they are carrying the overload. In such cases, a reasonable safety factor would suggest limiting the overload.

The president of one spring manufacturing concern says, "In my opinion, a truck operator should not attempt to increase the capacity of his truck springs by more than 35 per cent, or about one-third. This usually means the addition of three extra leaves in the main spring, and one or two extra leaves in the helper springs. Additional capacity in the springs would merely result in trouble with the axles, brakes, transmis-

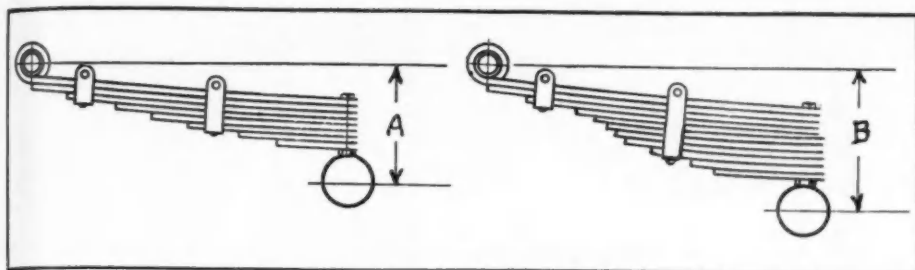


Fig. 1. Adding more than three plates to main leaf increases effective length and leverage of lever arm "A" when axle torque is applied in starting or stopping truck

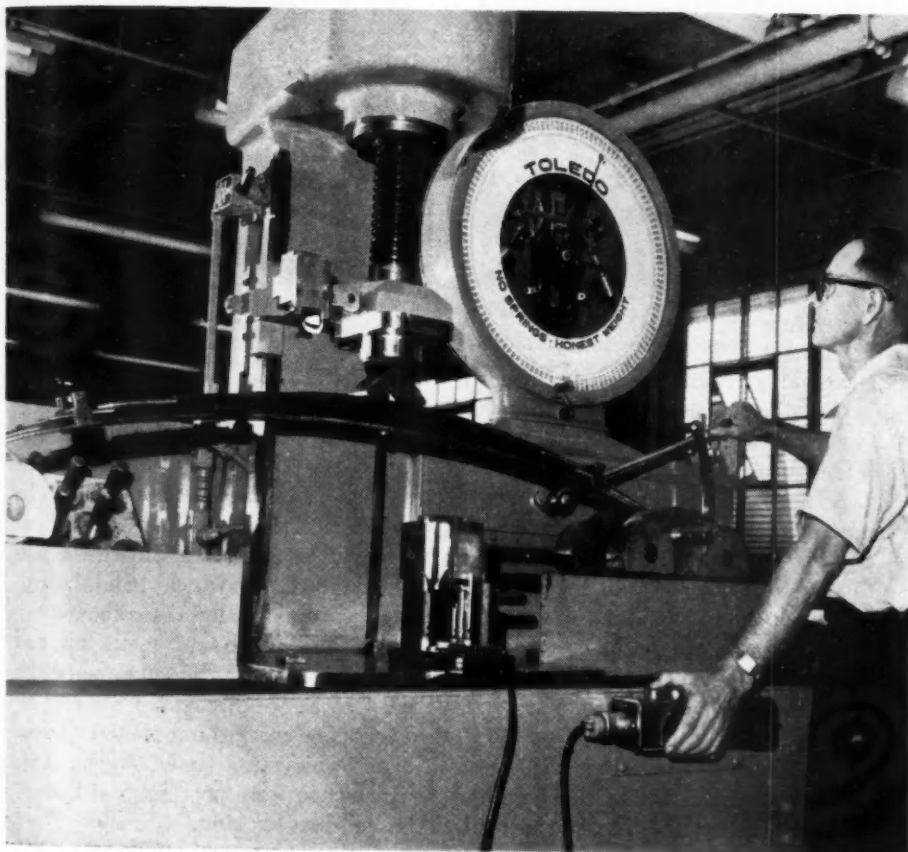


Fig. 4. Strength and flexibility of springs are tested on machines of this type

ticularly in the longer plate. "Another factor, although of probably less importance, is that adding more than three plates to the main spring (placed above the axle) increases the effective length and leverage of the lever arm "A" (from the center of the axle to the main leaf) when axle torque is applied to the springs in starting or stopping the truck. Fig. 1.

#### Proceed with Caution

IN modifying springs in the fleet field for increased loads, a prominent spring authority on the West Coast points out that "While leaves can be added to springs (preferably between the longer leaves), the result is, of course, that the 'spring beam' becomes excessively strong at its outer ends, so that the material is not stressed as efficiently as it should be.

"To add leaves intelligently, some idea of the carrying capacity, based on a reasonable stress would be helpful. Fig. 2 gives the load-carrying capacity per inch of width, using fractional thickness dimensions. For example, if in a spring 50 in. long by 3 in. wide you

want to add one leaf  $\frac{3}{8}$  in. thick, you will know that its carrying capacity at 60,000 psi stress will be 3 times 113 lb or a total of 339 lb.

"There are several methods of testing the deflection of springs, empty and fully loaded, in the field. Because of the interference of adjacent parts, the most obvious method (that of placing a straight edge bar of steel across, from the center of the

(TURN TO PAGE 98, PLEASE)

## Up Leaf Springs

sion, clutch or other chassis parts, since well-designed, modern trucks are engineered for approximately equivalent strength in the various units of the assembly.

The vice-president of another spring manufacturing company agrees with the above, in suggesting that fleet operators should not generally attempt to increase the capacity of truck springs more than about 35 per cent, explaining, "On many

trucks, the main leaf acts also as a radius rod and torsion bar. If the dead weight load carrying capacity of the spring is increased too much, by adding more leaves, and heavier loads are carried, then more 'torque' may be placed on the main leaf (when starting or stopping the truck) than the main leaf can carry. In such cases, the proper remedy may be to redesign the entire spring, using heavier (thicker) plates, par-

# Small Fleet

## Lowers the Boom on Accidents

Simple program utilizing class instruction, awards, better

records cuts accident rate from 22 to 8.2 in six months

By Paul M. Mayer

Sales Director  
Pepsi-Cola Bottling Co.  
Washington, D. C.

▼ EARLY last year we introduced a simple fleet accident control program that has paid real dividends with a minimum of effort. In the first six months, our accident frequency per 100,000 miles dropped from a high of 22 to 8.2. The rate, admittedly high at the start, still is going down.

We attribute the steady decline over this 6-month period to the in-

struction, retraining, accident review, periodic testing every 60 days, and a system of awards mapped out for us by our insurance company.

A fleet accident prevention committee of five service salesmen appointed by management was formed to review and determine cause of all accidents for better driver instruction and training. Meeting once monthly, they discuss with our staff of 36 service salesmen such typical leading hazards as backing, inter-sections, lane driving, speeding, passing, etc., in addition to the month's accidents in detail. The purpose of the committee is to give constructive



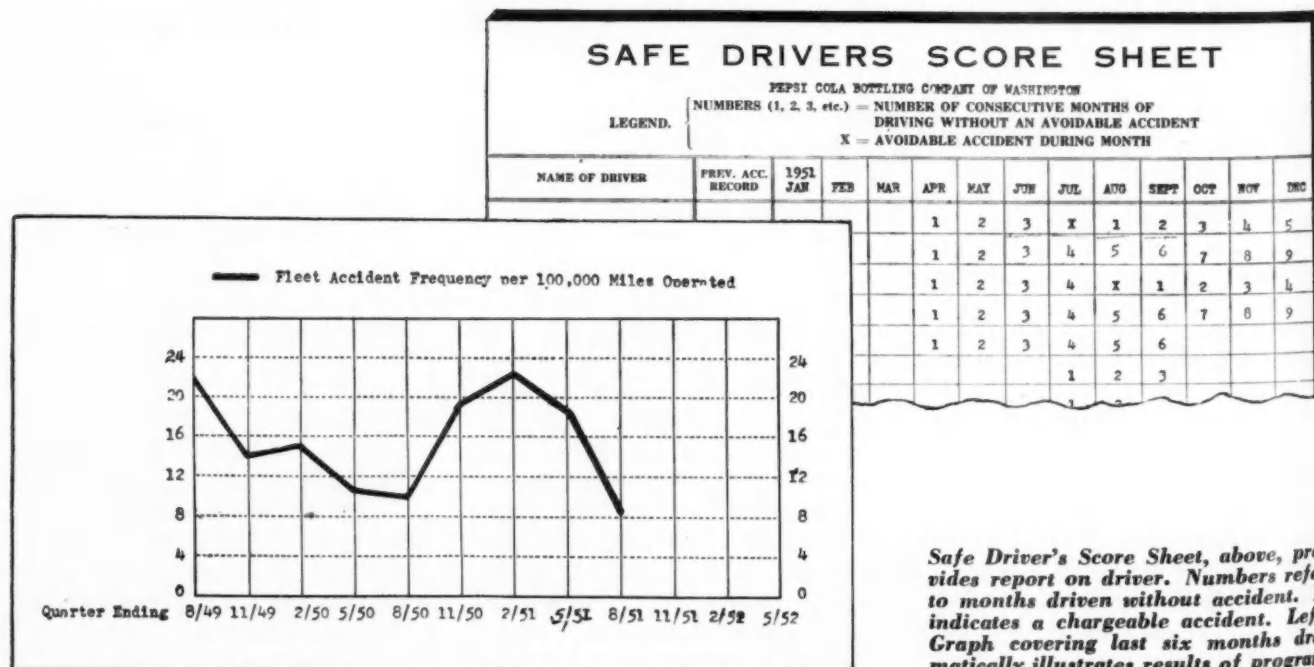
An accident situation is reproduced and solutions are discussed by drivers with use of a blackboard and models

help to prevent a recurrence of the same accident.

We have what we call a videograph to illustrate pictorially how accidents happen and how they could be avoided. This is a "blackboard" of specially processed cloth, with a felt-like texture, to which brightly colored cardboard figures adhere.

We had the board made up and had our own sign shop prepare the flat cardboard figures of streets, alleys, buses, trucks, ambulances, pedestrians, bicycles, traffic lights, etc., which then were processed with similar felt-like backing.

(TURN TO PAGE 128, PLEASE)



Safe Driver's Score Sheet, above, provides report on driver. Numbers refer to months driven without accident. X indicates a chargeable accident. Left Graph covering last six months dramatically illustrates results of program





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uly, 1952



Col. J. Paul Awtner, chief of ordnance, 2nd U. S. LOG Command explains to CCJ editor Len Westrate how tanks are handled at the headquarters of the 553rd Ordnance Reclamation Co. stationed in the field near Masan, Korea

Rough terrain, dust and abra-  
sive materials raise havoc with  
chassis parts, bearing surfaces  
and tires . . . but Army me-  
chanics "keep 'em fighting."  
Arctic Test Branch develops bet-  
ter fuels, cold weather lubri-  
cants, year-round coolants. . .

By Len Westrate  
CCJ Detroit News Editor

# Battle Area PM Poses Pressing Problems

FLEET maintenance supervisors who find the going pretty rough at times may take some comfort from the knowledge that their problems would be a great deal tougher if they had to maintain equipment under conditions facing Ordnance officers in Korea and Alaska.

Maintenance men in Korea say that operating conditions are the worst that the Army has ever encountered for several reasons. The road system, if it can be called that, is deplorable. There are practically no hard surface roads in the country, with the result that in rainy seasons they are muddy and filled with sink-holes and in dry seasons are covered with a thick coating of heavy dust. Because of the peculiarity of the terrain which consists of mountain ranges running the length of the country with valleys between, even during the dry season many of the roads, particularly in the

forward areas, have many sink holes caused by seepage from the surrounding hills. Army engineers have done a tremendous amount of work in building and maintaining roads, but it still is a constant battle to keep the roads passable. Only in the southern part of Korea does what can be called a fairly decent road system exist. For this reason, a very fine cooperative effort exists between the Korean National Railroad, which carries much of the supplies to forward points, and military trucking organizations which move supplies from rail heads and seaport towns to their ultimate destination in combat areas.

Trucking equipment in Korea consists entirely of World War II vehicles—primarily the GMC 6 x 6 "work horse," supplemented by a smaller number of Dodge 4 x 4 units. These trucks have been rebuilt in plants in the United States and in Japan and

are very serviceable vehicles, but, of course, cannot be expected to give quite the trouble-free service that would be possible with brand new trucks. Because of the bad roads, mortality is particularly high on such chassis parts as trunnions, springs, and other suspension components. One common failure is that rivets shear off in the plates attaching the trunnion to the frame. It is not uncommon to see two or three chassis parts lying in the road in the space of a mile in rougher stretches.

The thick, choking dust during the dry season also causes considerable trouble. Air cleaners clog up, and considerable difficulty is experienced with oil seals being abraded by the very fine dust particles. The rock, gravel, and other abrasive materials constantly being dumped into the roads to keep them passable are

(TURN TO PAGE 166, PLEASE)

# Thirty States Participate in Truck Roadeo Contests

State competitions now under way will test drivers' knowledge of safety, courtesy, efficiency and first aid as well as their skill in handling vehicle. Winners will go to N. Y.

THE ROADEO season is now well under way with thirty states holding competitions to select their winners in the various classes to send to the American Trucking Association's National Championships in Madison Square Garden in New York.

The roadeo is a test to determine, through a series of stiff competitive events, the contestant's knowledge of safety, courtesy, efficiency, and first aid and his skill in handling the type of vehicle used in his particular class of competition.

There are four standard classes of competition—straight truck, tractor with single axle semi-trailer, tractor with tandem axle semi-trailer, and truck with full trailer. In these four standard classes of competition at the annual National ATA Roadeo, each first place winner receives a large trophy which he retains as long as he successfully defends his title. He also receives a small trophy which is his to keep. Second and third place winners each receive a small permanent trophy. ATA awards each champion \$50.00 monthly for a year; each second place winner \$30.00 monthly, and each third place winner \$20.00 monthly for 12 months. Champions are chosen for each class—no "grand champion" for the combined classes is chosen. The champions receive nation-wide publicity and this, along with the other considerations, makes the National cham-

1952—State Roadeos				CLASSES			
Data Revised as of June 9, 1952							
STATE	Finals Date	Location	Straight	Single Axle Semi	Tandem Axle Semi	Truck Full Trailer	
Alabama			X	X	X	—	
California	Aug. 16	Fresno	X	X	X	X	
Colorado	Aug.	Denver or Pueblo	X	X	X	X	
Connecticut	June 14	New London	X	X	X	—	
Florida			X	X	X	—	
Georgia	Sept.		X	X	X	—	
Illinois	Aug. 15, 16, 17	Peoria	X	X	X	—	
Indiana			—	—	—	—	
Iowa		Des Moines	X	X	X	—	
Kansas	Aug. 29, 30	Augusta	X	X	X	—	
Kentucky	Sept. 6	Louisville	X	X	X	—	
Maine	July 26	Bangor	X	X	—	—	
Maryland	Sept. 12-13	Baltimore	X	X	X	—	
Massachusetts	June 7	Boston	X	X	X	—	
Michigan	July-June 26-27	Lansing	X	X	X	X	
Minnesota	Sept.	St. Paul	X	X	X	—	
Mississippi	Sept. 1	Biloxi	X	X	X	—	
New Hampshire	Sept.	Manchester	X	X	—	—	
New Mexico	Sept.	Albuquerque	X	X	X	—	
North Carolina	June 13-14	Winston-Salem	X	X	X	—	
North Dakota	Aug. 3	Grand Forks	X	X	—	—	
Ohio	Sept. 5-6	Columbus	X	X	X	X	
Pennsylvania	Sept. 3-4	Hershey	X	X	X	—	
Tennessee	Sept. 9-10-11	Memphis	X	X	X	—	
Texas	Local Possible		—	—	—	—	
Utah	Sept. 10-13	Salt Lake City	X	X	X	X	
Virginia	June 6, 7	Richmond	X	X	X	—	
West Virginia	Sept. 17, 18		X	X	X	—	
Wisconsin	Sept. 13-14	Mauston	X	X	X	—	
Canada	Dec.	Toronto	—	—	—	—	

pionship a coveted honor among truck drivers. The following gives a résumé of the minimum tests used in the Truck Roadeo.

## Appearance and Knowledge Tests:

THE first test is on appearance.

The contestant is judged on his appearance and personality. A perfect score totals 10 credit points.

The second test is composed of

four (4) written examinations on knowledge of (1) safe driving rules, (2) the trucking industry, (3) first aid, and (4) fire fighting. A perfect score of 25 credit points on each of the first three examinations and 15 credit points on the last gives the contestants a total of 90 credit points.

In this opening group of tests the contestant can gain 100 total credit points and be well on his way toward (TURN TO PAGE 132, PLEASE)

# Free

## PUBLICATIONS

FOR YOUR CONVENIENCE USE THE POSTCARD ON NEXT PAGE

### L1. Spray Gun Lettering

Details and a general, working understanding of spray or mask lettering of commercial vehicles have been offered in a booklet just published. The booklet shows how the system may be used in the smallest painting area or spray booth. The booklet describes the process, giving many tips and pointers to assure a clean, sharp copy. For your copy write L 1 on the post card.

### L2. Highway Statements

The criticism that the trucking industry and its allies are lax in their public relations efforts has been dealt a "right cross" with a 28-page pictorial booklet published by Fruehauf Trailer Co. "Public Servant No. 1" is a story of the American highway system in pictures. It is based on 10 challenging statements that tell the truth about highways, their use and construction.

It discusses road construction from its foundation, the subsoil, to the riding surface. In that connection, the booklet points out that it is the purpose for which the road is constructed that determines whether or not it is truly a "modern" road.

Other subjects covered include (2) "Roads are primarily for the conduct of business and commerce, they are not monuments!" (3) "Nature is the major enemy of roads, not weight and traffic!" (4) "Private motor cars travel more than 80 per cent of the total vehicle miles on U. S. highways, motor transport accounts for the rest!" (5) "No one knows how heavy a load a properly built and maintained road can carry!" (6) "Proper and regular maintenance is the most important factor in road life!" (7) "The cost of the road surface, the part that takes

the wear, is only a portion of the total highway cost!" (8) "Bridges should be built to match the road, not to fit a low-cost budget!" (9) "Motor transport already pays its full share of the use and maintenance of roads!" (10) "Motor transport performs an irreplaceable public service by delivering goods faster and cheaper than other forms of transportation despite handicaps imposed on no other carrier!" To get a copy, mark L 2 on the post card.

### L3. Two-Way Radio Guide

Here's a booklet that describes the advantages of 2-way radio, what it is, what it does, how it works. It explains how a 2-way radio setup enables a fleet operator to cut down on dead mileage, move a greater volume of freight, and maintain supervision of trucks en route. There are applications which may be applied to inter-city and urban bus and trolley lines for more efficient handling of peak loads, emergencies caused by breakdowns or traffic jams. For your copy, mark L 3 on the post card.

### L4. Truck Tire Data

Covering every phase of tire selection and maintenance, a data book has been prepared which is a valuable addition to fleet operators' reference material. It discusses tire selection in general, showing how the various types of tire treads may be applied to a specific job. A section discusses load distribution as it relates to tire use, and it shows in diagram how proper load distribution may save tire dollars.

There is a table of inflation pressures arranged by tire sizes, based on

a 30 mph average speed. By a reverse method, the proper tire size and inflation pressure is tabled by payload. As a further cross reference, there is a table of weights and pressures arranged by tire size. In the latter table, the operator may obtain the maximum payload by finding the tire size, following across to the average road pressure, and the figure at that point will give him the maximum load allowed.

How and when to rotate tires are discussed, as well as mechanical inspection of parts that affect tire wear. Recommendations concerning tire maintenance are proposed. And as a conclusion, the proper rim size and type appear in table form. For your copy of this data book, mark L 4 on the post card.

### L5. Training Manual

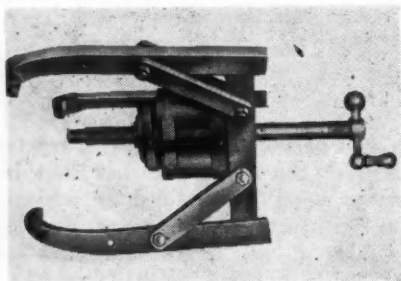
Instruction Manual No. 6 has been issued by the Leece-Neville Co., Cleveland to provide authentic information on the purpose, functions, operation, servicing, and trouble-shooting of an alternator system.

With basic diagrams, easily read and understood, the mechanic or supervisor is brought up to date on this important part of the electrical system, which actually amounts to a system within a system. The manual describes the function of each section involving the voltage regulator, current limiter and load relay, giving for each operation, a two-color diagram. The text then proceeds to discuss the possible trouble which may develop in each section of the system. The circuits under discussion are printed in red so that the reader may follow the diagram in close detail. For your copy mark L 5 on the post card.



# NEW Products

ADDITIONAL DETAILS AVAILABLE UPON REQUEST VIA POSTCARD



## P35. Puller Adapter

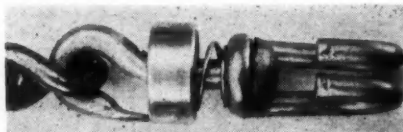
The OTC Power Twin hydraulic puller has been adapted for use with the Owatonna 3-arm pullers. Users need only a special 3-way head to convert the 3-arm puller to hydraulic power, with three new heads available for the corresponding sizes of hydraulic units.

## P36. Radio Transmitters

Filling the need for mobile units in the newly authorized 152-174 meter band, Bendix Radio, Baltimore, Md., has announced a completely new line of mobile communication equipment. Called the "Command-Air" series, the new sets will operate in the ultra-high frequency band and will be adaptable to all VHF mobile applications. A complete line of microphones, antennas, headsets, handsets, speakers and accessory equipment will be available. The sets will have either the three-unit assembly (transmitter, receiver, power supply) or the single package involving the same operations. Mobile output will be 10, 25, 30 or 60 watts with fixed station power up to 250 watts available. Input will be either 6 or 12 volts.

## P37. Water Pumps

An assortment of water pumps has been added to the pumping units manufactured by Airex Automotive Division, Fairchild, Ill. The new units are available as replacements in all makes of passenger cars, trucks and buses.



## P38. Skid Chain Link

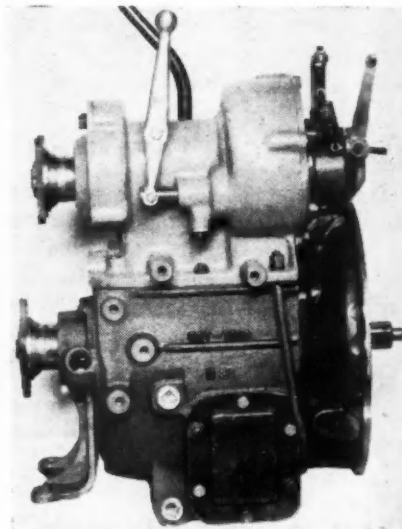
For attaching cross chains to side chains without the use of tools, this device has been developed by a Roll-O-Matic Chain Co., Kansas City, Mo. The fastener may be used on trucks and other heavy-duty tires. The circular collar shown in the picture, is held in place by a spring, closing the hook. This hook engages the first link of the cross chain. It pivots, permitting the cross chain to turn while in use. Cross chains may be replaced without tools by depressing the collar, opening the link hook.

## P39. Cold-Tank Cleaner

A multi-purpose liquid, cold-dip cleaner for small parts that does not require heating, or that does not have poisonous, inflammable fumes has been developed by Kelite Products, Inc., Los Angeles, Calif. Called Formula 555, it is to be used primarily in the dip-cleaning of carburetors, fuel pumps, hydraulic brake parts, filter screens and diesel engine parts, although it may be used for other washing and cleaning applications as well. The manufacturer states it leaves the parts clean and dry without tarnishing the metal finish.

## P40. Electrical Connector

A multi-pronged electrical connector for trailer applications has been released by the Cole-Hersee Co., Boston, Mass. A tongue-and-groove arrangement in the receptor and connector make alignment of the male prongs automatic, the manufacturer states. The connector fits a wide range of cable sizes and is available in 7-way, 6-way, and 4-way models.



## P41. Power Take-Off

A top-mounted, power take-off that becomes an integral part of the transmission has been developed which may be installed and operated without affecting the standard driving mechanism. The "Tangen Power Drive" is installed at the transmission cover with a slight alteration in the transmission casting for mounting. The manufacturer states that the unit will deliver 97 per cent of the rated engine deliver from the main drive gear in the transmission.

The Tangen drive will fit Ford trucks equipped with 4-speed spur gear transmissions (F-1 through F-6); Dodge B-3 series; and other trucks using Warner T-8, T-9, T-9A transmissions. The latter group include various models of Diamond T, Federal, International, Reo, Studebaker, White, and others. Mobile Power, Inc., Detroit.

## P42. Thread Restorers

Herbrand Tools, Fremont, Ohio, has introduced a set of 8 sizes of thread restorers for USS threads. They are the same size as the nuts which normally are used on the threaded end, so need no special tools or jigs.

The latest developments in parts, accessories, equipment and tools for the fleet shop

FILL IN CARD WITH APPROPRIATE NUMBERS FOR MORE INFORMATION

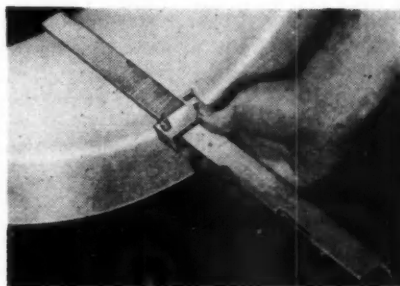


#### P43. Fluid Dispenser

An automatic transmission fluid dispenser has been introduced which draws from original 100-lb drums and can be used with a four-caster drum dolly. Cleanliness is assured by a tight-fitting gasket and cover, a nozzle filter and knurled tip. The fluid hose is 7 in. long exclusive of the filter and nozzle. It is attached to a double-dial meter that indicates quarts and fractions up to 16 qt. It is listed as Model 60034 by the Aro Equipment Corp., Bryan, Ohio.

#### P44. Oil Seal

A two-piece, bearing-type oil seal for main rear bearings has been developed by Brummer Mfg. Co., Chicago. The manufacturer states that the seal replaces rope or wicking normally used as a sealing agent. It is made of an oil-resistant rubber, molded into a lip-type seal on a half-circle, U-type channel metal band. By fitting two of these seals around the crankshaft and tightening together, a positive oil seal is obtained. The assembly is similar to that of the bearings.



#### P45. Rim Gage

Truck rims can be measured and matched with a new rim gage, introduced by Seiberling Rubber Co., Akron, Ohio. It is of cast aluminum, made to measure both flat and wide-base truck rims. It is an aluminum bar, one end of which is hooked over the edge of the rim opposite the operator. The operator then moves an attached slide bar until it touches the rim edge next to him. One side of the gage measures Goodyear rims and Goodyear-Cleveland Weld Rims while the opposite side is graduated for Firestone and that type Cleveland Weld Rims.

#### P46. Vernier Caliper

An imported vernier caliper is available from Master Rule Co., Middletown, N. Y. The slide of the caliper is equipped with a knurled, friction lock that works with thumb pressure. The slide is 8 in. long; the tool itself is 3 in. wide; the scale 6 in.; and the caliper 19/16 in. deep.

#### P47. Dump Hoists

Fourteen models in a new line of hydraulic dump truck body hoists have been introduced by St. Paul Hydraulic Hoist, Minneapolis, Minn. An increase in payload capacity of about 22 per cent has been claimed by the manufacturer, in addition to the units being at the lowest standard mounting height, an advanced lifting point, a new low operating oil pressure, a new sub-frame, and several improvements in drive.



#### P48. Chain Hoist

A chain hoist for general use with push-button control is available in capacities from 250 lb to 2000 lb. It is a plug-in operation from any single phase 115-220-440 v line. Chisholm-Moore Hoist Corp., Tonawanda, N. Y.

#### P49. Grinding Attachment

A device that will convert straight-spindle air or electric tools to abrasive belt grinders is made of light weight aluminum and consists of an idler pulley, the supporting mechanism and a contact wheel. The latter is mounted at the end of the tool spindle.

The unit is attached by a split bracket to the casting of the tool where the grinding wheel guards normally are mounted. The bracket makes the attachment adaptable to almost any portable tool of the proper speed and type. The attachment calls for a drive unit with from 5000 to 10,000 fpm belt speeds.

Carborundum Co., Niagara Falls, N. Y., has listed the attachment as the "61 Portabelt," and Buckeye Tool Corp., Dayton, Ohio, has it as the "Buckeye Belt Grinding Attachment."

(TURN TO NEXT PAGE, PLEASE)



# New Product Descriptions

Continued from Page 75

## P50. Lube-gun Valve

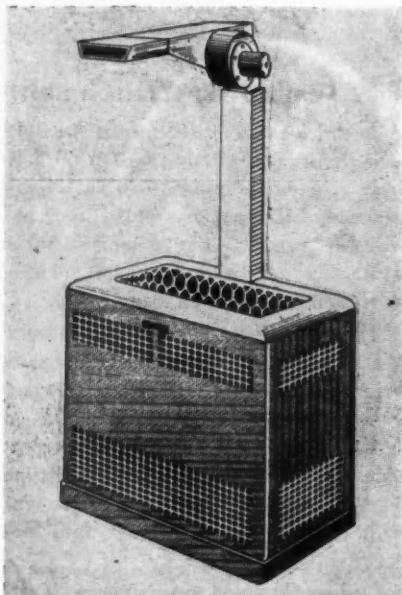
A high pressure lubricant control valve, Model 7421, has been introduced by the Alemite division of Stewart-Warner Corp. The operator may choose either full flow of lubricant or a wide range of measured shots of lubricants by twisting a knob. The new control valve fits any high pressure hose regardless of the make.

## P51. Two-Way Radio Sets

A new line of radio communications equipment operating on the 450-470 meter "Citizens' Radio Service" band has been introduced by Motorola, Inc., Chicago. The line, which includes mobile units operating on 6 v or 12 v systems, was developed in response to a demand by many business firms, industries and individuals who have found need for 2-way radio, but were unable to qualify under existing band regulations of the Federal Communications Commission. A recent revision of existing regulations has opened the new band for limited-radius sending and receiving.

## P52. Truck Refrigerator

A non-mechanical ice refrigeration unit has been introduced by Air Induction Corp., New York. It uses a circulating air principle to cool the interior of truck bodies from 150 to 600



cu ft capacity. A uniform temperature from 40 to 44 deg F has been maintained under summer conditions with an outside thermometer reading up to 95 deg, the manufacturer states.

## P53. Inspection Unit

A portable magnetic inspection unit which leaves no residual magnetism in the part inspected has been developed by the Sonoflux Corp., Houston, Texas. It will detect surface flaws in ferromagnetic materials based on these fundamental principles:

A magnetic field is established around any electrical conductor through which an electric current is passed. Ferromagnetic material placed in effective range of this established field becomes magnetized. The inspection unit operates on this basic principle.

A break in the part inspected causes a magnetic reaction in the usual magnetic pattern, so that when a spray of tiny iron particles is dusted across the flaw, the flaw becomes outlined and visible to the naked eye.

The unit produces a localized magnetic field which makes it possible for the generating device to be much smaller. Two magnetic transmitters are used. One is "C" shaped, with the open ends of the "C" acting as the magnetic poles. The other is a ring. Placed over a cylindrical object, the ring produces the same detecting results.

## P54. Fork Trucks

Designed for handling double-faced pallets, an improved truck has been announced by the Service Caster and Truck Corp., Albion, Mich. The "Leverlift" features a forked design platform with toggle boosters on the ends of the platform tines which engage the bottom face of the pallet first lifting the platform slightly so that the rear wheels can roll smoothly into the pallet.

The rear wheels of the forks are then projected through the bottom of the pallet and the load is lifted by action of a hydraulic pump. As the platform is raised, it moves toward the operator, facilitating use against walls. The capacity of the truck is 4000 lb., and it is available with five standard fork lengths.

## P55. Steam Cleaner

Available in several models and designs adapted to the type of service required, the "Auto-Steam" vapor cleaner has been introduced by Aeroil Products Co., South Hackensack, N. J. It is equipped with a 1/2 hp motor, has a rated capacity of 120 gal per hour at 75 to 110 lb working pressure.



## P56. Tailgate Lift

A small, electric operated hydraulic lift has been made available by Revolver Co., North Bergen, N. J. It operates on 110 v house current, or may be had with a 6-v storage battery motor, with a built-in charger. The forks operate on a double roller chain arrangement that meets all minimum safety standards. The operator moves the lift by hand on swivel rollers that may be locked in place by a lever-jack in the center of the base.

## P57. Battery Cap

A battery cap that replaces evaporated water from battery cells has been developed which uses a chemical element or catalyst which converts the escaping hydrogen and oxygen gases back into water. Called the "Hydrocap" by Industrial Research, Inc., Miami, Fla., they will fit standard battery filler holes and are sold in sets of three. The manufacturer points out that the escaping gases also carry corrosive sulphuric acid fumes which normally escape and cause electrode and terminal corrosion. The Hydrocaps also heat up if there is an overcharge, and warn the vehicle operator that the voltage regulator should be checked. They reach about 200 deg F when there is an overcharge. Heart of the new device is a palladium catalyst which is concentrated in the cap and will capture 95 per cent of the escaping water, the manufacturer claims.

## P58. Warning Torch

A self-lighting emergency torch containing a solid odorless fuel has been introduced by Cresset Chemical Co., Weston, Ohio. The manufacturer states that the torches have a self lighting arrangement similar to a safety match or railroad fusee, and that they will burn for two hours.



Late-model cars and trucks operate at



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**Sealed Power  
KromeX**

**FULL-FLOW RING SETS**

**TOP COMPRESSION RING  
HAS SOLID CHROME FACE**

factory-lapped to a light-tight finish

**MD-50 STEEL OIL RING  
HAS CHROME-FACED SIDE RAILS**

The only ring with the FULL-FLOW SPRING

Best for oil control even in

**BADLY TAPERED**

and

**OUT-OF-ROUND BORES**



All rings in KromeX Ring Sets are beveled or tapered  
to thread-line contact for quick seating  
and blow-by control.



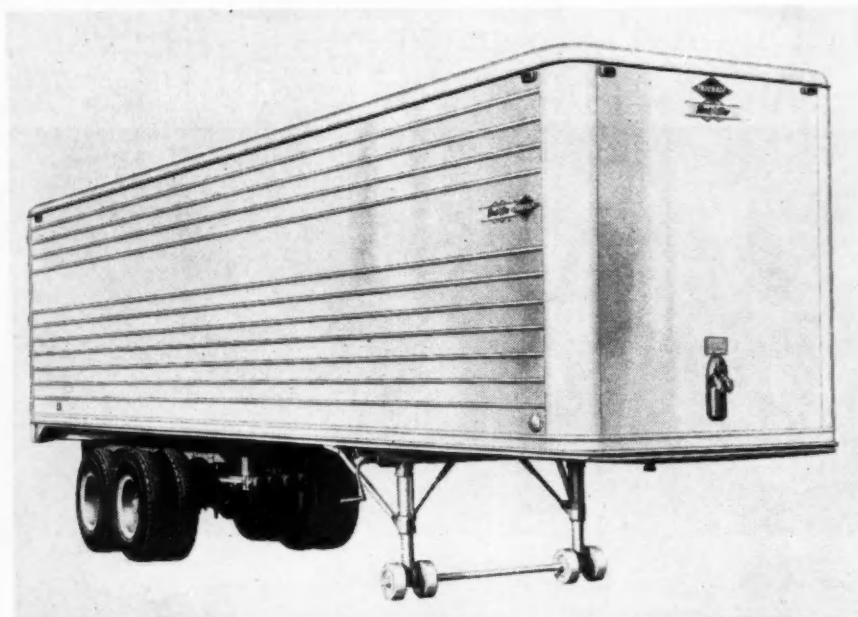
SEALED POWER CORPORATION, MUSKEGON, MICHIGAN

**Sealed Power Piston Rings**

BEST IN NEW TRUCKS

BEST IN OLD TRUCKS

# Fruehauf Introduces Aluminum Van Trailer



**Road ★ Star** smooth-panel van uses extruded aluminum sections, forged aluminum wheels, light metal floors, doors and panels . . . offers increased weight saving advantages . . .

*Forged aluminum wheels save over 90 lb per axle, provide stronger assembly. Smooth panels offer display surface*

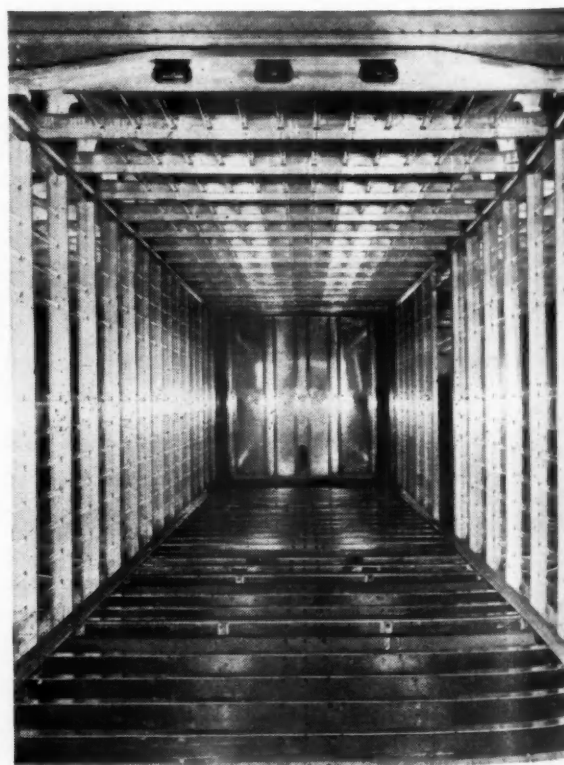
*Two speed aluminum supports save 125 lb weight. Deep girder-type aluminum cross-members provide same load capacity as steel, weigh ½ as much*

**FRUEHAUF** Trailer Co. is in production with its new, smooth-panel aluminum van trailer incorporating many advances in design and construction proven to be sound in aircraft engineering. Outstanding among these developments are the use of monocoque construction and the employment of extruded aluminum shapes which given high strength and rigidity at a minimum of weight. These extruded sections include Z-bar columns and bows providing a rigid box construction.

The use of aluminum in many forms throughout structural parts has resulted in saving in weight in many of the vital units of the new truck-trailer. For example, the wheels are forged aluminum, which saves over 90 lb per axle and yet provides a wheel stronger than with the usual steel construction.

Another saving of 125 lb, all of which is convertible into payload, is provided by the exclusive two-speed aluminum supports. Another point where weight is saved without sacrificing strength is in the deep, pressed girder-type aluminum cross-members which give the same load capacity as steel, yet weigh only one-half as much.

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THE TONN

COMMER

# If Your Brake Costs Are Running Too High

MIKE, I WANT  
TO GET YOUR IDEAS ON  
CUTTING DOWN OUR BRAKE  
MAINTENANCE COSTS.

I THINK WE OUGHTA PUT  
ON BIGGER POWER BRAKES  
... GET 'EM SO THEY  
MATCH OUR LOADS.



That mechanic is giving the boss some mighty sound advice. When brake adjustment and repair costs are out of line, a larger power brake and master cylinder can cut them to where they *should* be.

If you are hauling heavier loads . . . and if your brake maintenance expense is too high . . . *match the braking to the load*. Beef-up your brakes with a Bendix\* Load-Rated Hydrovac\* Power Brake—there's a model for every load—and the linings and the drums will last longer. Because they last longer, fewer adjustments are needed so you gain all around.

Your Bendix Hydrovac dealer can step-up your power brakes for surprisingly low cost and he can do the job quickly, without tying up your equipment. Call him today and ask about Bendix *Load-Rated* Hydrovac Power Brakes.

\*REG. U.S. PAT. OFF.

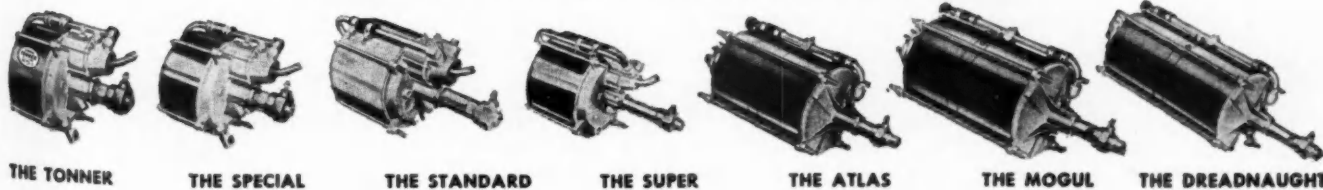
**Bendix** SOUTH BEND  
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POWER BRAKE!

A MODEL FOR EVERY LOAD FROM ½ TON TO THE BIGGEST!



THE TONNER

THE SPECIAL

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THE SUPER

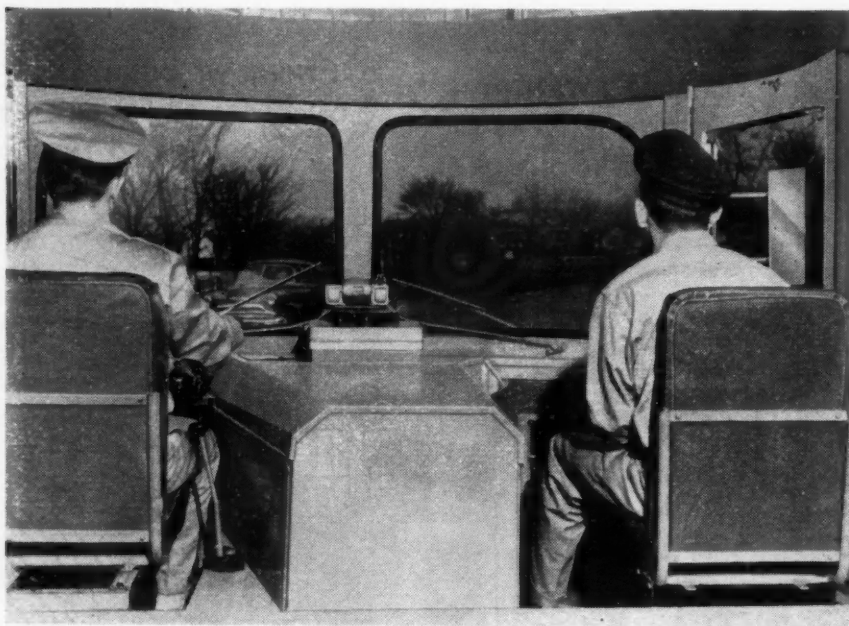
THE ATLAS

THE MOGUL

THE DREADNAUGHT

COMMERCIAL CAR JOURNAL, July, 1952





*Above left. Good driver visibility, easy engine accessibility are characteristic of this vehicle. Above. Bridge type construction replaces truck frame, permits floor to be placed 4 in. lower*

**Engine, transmission, axles, steering, instruments are same as those used on IHC L-150 to L-200 series. Short, light van offers versatility for city use.**

# Fageol Vans

## Use IHC Components

**V** A NEW LINE of van type trucks which are reputed to carry larger payloads than any other trucks of equal body lengths is announced by Twin Coach Co., Kent, Ohio.

Known as Fageol Vans, these trucks utilize many mechanical components of standard International Harvester Trucks. Engine, transmission, axles, steering, instruments and other parts are the same as those used in International L-150 to L-200 series trucks.

According to the manufacturer, Fageol Vans substantially reduce the

amount of space ordinarily required for the driver's cab and engine in conventional and cab-over-engine trucks. Consequently, they are said to provide at least 200 cu ft more payload space than is available in other designs. Engine is mounted between the driver's seat and helper's seat within a hinged compartment that is readily accessible.

Fageol Vans are available in nine body sizes, ranging in length from 20 to 35 ft. Only 4 ft is taken up by driver's compartment and engine, leaving the balance available for pay-

load. Inside body heights on standard models can be fixed at any desired point between 6 ft and 8 ft.

These trucks differ from the conventional types in that the bodies, which are of bridge type construction, replace the truck frames. As a result, every one of the body uprights and cross members is a part of the truck itself and, therefore, lends added strength to the overall vehicle.

The manufacturer states that Fageol Vans are suitable for every use in which large quantities of merchandise must be delivered quickly and economically. They are particularly recommended for beverage distributors, caterers, chain stores, dairies, department stores, express services, florists, furniture stores, grocers, moving vans, newspapers, parcel deliveries, public utilities and many other applications.



# DIAMOND T

USES

# SHULER AXLES



## THERE ARE NO BETTER AXLES, AT ANY PRICE!

Since 1915, Manufacturers of: *One-Piece* Tubular and Square Commercial Trailer Axles, Heavy-Duty Front Axles for Trucks, Busses, and Off-Highway Equipment, Low-Bed Machinery Trailer Axles, Heavy-Duty Vacuum and Air Brakes, Miscellaneous Forgings.

**SHULER AXLE COMPANY, Incorporated, LOUISVILLE, KENTUCKY**

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CHICAGO OFFICE  
615 Davis St., Evanston

DALLAS OFFICE  
3402 McFarlin Blvd.

EXPORT DIVISION  
38 Pearl St., New York

WEST COAST WAREHOUSE  
1280 Forty-Fifth St., Oakland

SOUTHWEST WAREHOUSE  
301 N. W. 28th St., Fort Worth

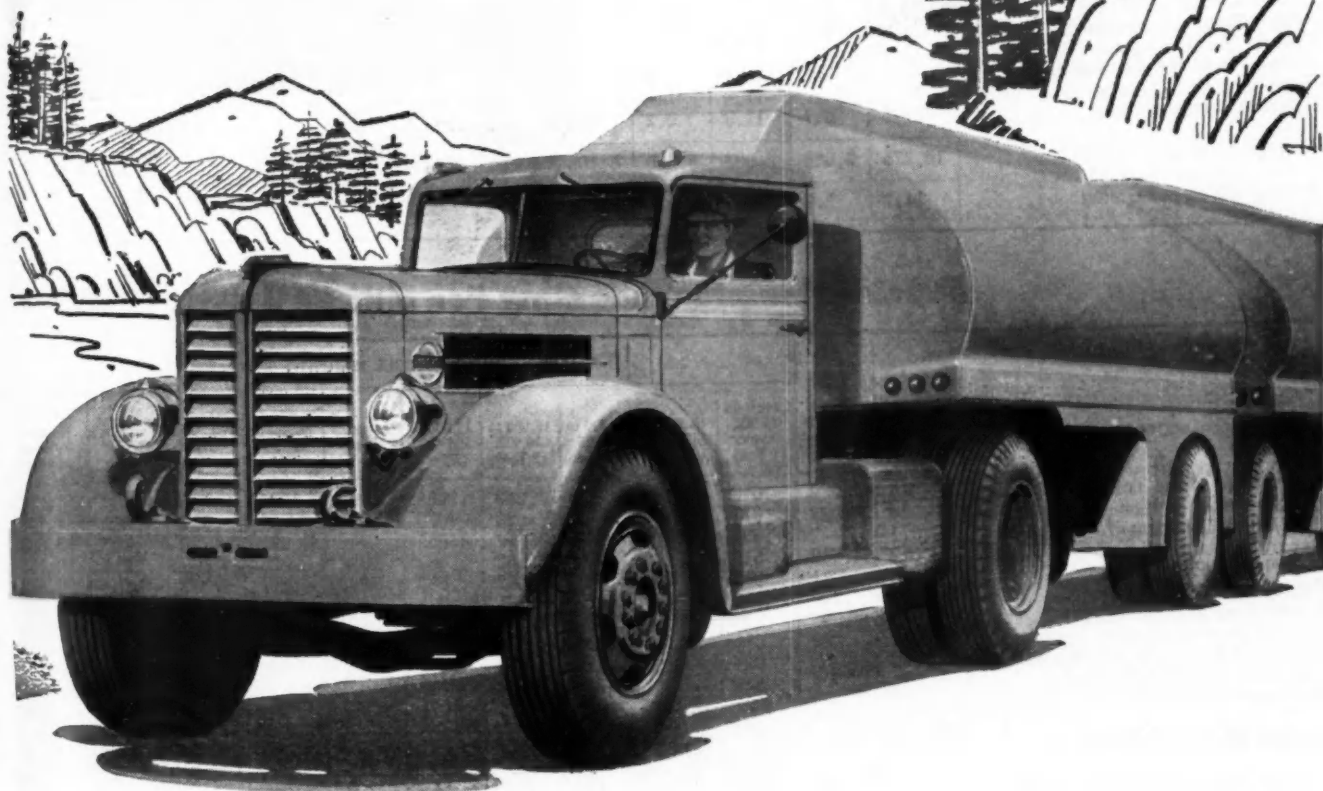
NORTHWEST WAREHOUSE  
1238 N. W. Glisan St., Portland

# 1952 New Truck Registrations by Makes by States\*

STATE AND MONTH	Auto-car	Brock-way	Chevrolet	Diamond T	Divco	Dodge	Federal	Ford	FWD	GMC	International	Kenworth	Mack	Peterbilt	Reo	Sterling	Studebaker	White	Willys	All Others	Total
Alabama	April 2	1	452	1	3	178	2	340		146	117		27		2		42	27	19	2	1,361
4 Mos.	6	3	1802	11	9	820	2	1081		533	386		59		9		173	83	102	4	4,893
Arizona	April 1		187	1		54	1	163		233	192		1	2	1		14	3	24	2	580
4 Mos.			552	4	1	207	1	416		223	114		6	2	9		55	9	71	17	1,779
Arkansas	April 1		488			142		357		223	114		10		2		57	6	26	1	1,427
4 Mos.			1974	3		487		1169		721	381		13		2		191	20	97	5	5,064
California	April 8	1	1686	28	29	860	2	978		615	432	25	25	8	16	8	158	34	69	36	4,804
4 Mos.	38	13	5651	87	82	2671	5	3523	36	2112	1687	95	79	26	54	13	585	161	437	63	17,448
Colorado	April 1		418	2	4	60		270		105	112	2	2		2		35	5	74	7	1,101
4 Mos.			1138	7	15	257		848		372	402	6	30		11		126	17	159	15	3,411
Connecticut	April 1	5	240	10	10	86	5	160		46	71		22		12	2	26	14	12	4	728
4 Mos.	15	15	676	31	41	307	8	457		163	234		60		23	2	77	34	55	25	2,223
Delaware	April 1		88	3		19		61		14	27		2		1		10	4	1	1	237
4 Mos.			284	7	7	82	1	224		57	87		3		1		29	11	7	3	808
Dist. of Col.	April 3	3	79	8	7	16		38		18	18		3		1		4	4	4	1	200
4 Mos.			263	13	14	100		129		76	64		4		8		1	7	9	5	711
Florida	April 5		607	8	4	179		424		151	143		21		7		98	32	55	13	1,743
4 Mos.	15	3	2052	39	30	929		1621		510	604		95		30		392	117	219	84	6,729
Georgia	April 1		403	1	3	156	1	331		129	98		25		3		52	9	13	1	1,226
4 Mos.		2	2257	23	13	862	1	1527		682	532	1	66		16		327	56	82	9	6,456
Idaho	April 1		190	3	3	187	3	384		80	64		1		1		23	6	28	1	569
4 Mos.			531	3	3	187	3	384		268	225	1	9		4	3	91	9	138	2	1,863
Illinois	April 5	1	1100	47	13	466	2	834		282	560		21		13		87	47	63	24	3,568
4 Mos.	74	3	4299	209	68	2006	10	3200	2	1169	2148		85		56		396	226	229	73	14,215
Indiana	April 1		616	11		277	3	441		172	251		21		11		112	32	31	9	1,969
4 Mos.		4	2035	25	24	846	4	1450	1	527	900		40		43		365	171	80	24	6,539
Iowa	April 1		507	4		153	1	388		108	240		1		7		45	8	27	3	1,497
4 Mos.			1742	21	9	526	2	1254		376	874		11		14		163	43	100	18	5,153
Kansas	April 1		557	8	6	157		415		173	257		5		2		65	14	27	2	1,882
4 Mos.			1559	15	11	477	1	1088		467	689		5		9		149	45	82	6	4,602
Kentucky	April 1		559	4		123	1	387		184	164		1		4		53	10	50	7	1,558
4 Mos.			1719	14	3	502	4	1195		540	559		8		10		204	36	162	18	4,975
Louisiana	April 1		469	1		132		338		134	93		7				56	11	27	5	1,273
4 Mos.			1670	8	6	463		1273		523	415		17		3		203	34	87	12	4,714
Maine	April 1		137	1	1	39	1	132		41	41		8		1		19	1	5	3	430
4 Mos.			511	3	2	143	3	381		183	169		30		4		62	10	52	12	1,560
Maryland	April 17	4	378	6	3	184	4	304		76	123		21		3		22	21	22	4	1,175
4 Mos.	40	16	1051	9	13	426	10	721	2	208	362		59		15		70	49	51	33	3,138
Massachusetts	April 19	2	363	7	14	164	5	277		92	134		34		3		27	28	16	5	1,199
4 Mos.	55	21	1140	40	37	533	9	935	2	278	403		97		24	8	133	105	74	30	3,934
Michigan	April 6		954	6	11	334	5	1035		201	157		19		19		64	19	42	5	2,881
4 Mos.	17	2	3381	32	27	1290	27	3534		693	696		47		73		216	71	134	50	10,550
Minnesota	April 1		688	2	2	234	4	425		108	236		6		12		74	5	35	4	1,636
4 Mos.			1816	10	14	633	4	1241	9	363	833		14		24		223	29	96	23	5,432
Mississippi	April 1		429	1		47		294		157	102		7		1		63	4	26	1	1,175
4 Mos.			1733	3	2	447		1052		704	421		7		5		216	17	64	8	4,676
Missouri	April 1		796	10	7	202		445		215	211		4		5		54	29	19	5	2,003
4 Mos.			2938	29	52	915	1861	2	893	935	1		17		14	4	245	119	84	16	8,125
Montana	April 1		162	1	3	38		122		46	86		6		4		25	1	45		536
4 Mos.			556	14	3	164	1	444	2	192	375		6		9		99	7	186		2,076
Nebraska	April 1		392	13	1	57		268		99	149		6		1		44	7	33	4	1,076
4 Mos.			1311	42	7	280	1	976	7	395	555	31	12		10		142	50	141	7	3,947
Nevada	April 1		145	1		17		36		29	25		1				9		31		172
4 Mos.			444	1		79		67		67	63		1				19		31		476
New Hampshire	April 1		87	2	1	34	1	84		33	40		19		3		20	2	15	1	343
4 Mos.			300	3	6	100	1	216	2	95	108		31		5		39	26	50	3	990
New Jersey	April 11	15	614	11	14	238	6	560		189	202		39		9		45	36	52	18	2,061
4 Mos.	24	69	1817	37	67	747	13	1482	8	610	693		122		32	5	153	124	138	41	6,182
New Mexico	April 1		239			55		202		82	64		19		3		41	4	25	4	740
4 Mos.			718			162		451	3	271	176		2		8		105	21	70	11	2,050
New York	April 10		1247	32	29	562	9	868	4	328	438		94		29	8	89	70	99	23	4,020
4 Mos.	17	76	3612	148	98	1685	36	2432	21	1048	1390		318		133	19	274	245	265	127	12,112
North Carolina	April 6		664	8	6	195	2	450		190	176		29		3		85	28	44	4	1,886
4 Mos.	14		2503	23	19	1062	7	1627		692	709		95		13		328	147	139	32	7,418
North Dakota	April 1		207		1	50		167		42	132						22	4	9	1	538
4 Mos.			616	2	1	184		508	2	156	487		3		1		76	7	71	3	2,117
Ohio	April 1		1169	14	17	447	27	823		251	415		36		19		124	109	112	20	3,887
4 Mos.	14	2	3607	49	103	1821	42	2948	3	917	1457		126		89		442	364	309	73	11,866
Oklahoma	April 1		559			147		465		9	183		1		8		54	23	22	11	1,643
4 Mos.			1884	2	15	531		1391	21	478	645		25		6		170	102	81	22	5,378
Oregon	April 1		292	14	1	109		190		137	134		8		9	2	32	23	44	9	1,056
4 Mos.			1006	46	10	432	7	660	3	415	404	33	88	32	2		113	43	198	45	3,548
Pennsylvania	April 4		860	16	27	430	4	802		270	438		87		28	4	90	75	56	28	3,370
4 Mos.	20	33	3632	59	79	1665	22	2532	1	976	1605		249		83	6	382	256	232	69	11,942
Rhode Island	April 1		66	1	3	32		74		16	36		8		1		6	3	5		237
4 Mos.			215	3	4	98		201		34	109		19		1		21	11	15		743
South Carolina	April 1		354	1	2	90	2	223		71	170		5				38	12	4	7	980
4 Mos.			1674	10	4	379	2	856	2	324	455		30				146	34	33	26	3,977
South Dakota	April 1		168	3		51		134		37	171						16	34	22	1	1,673
4 Mos.			429	7	2	147	1	418	1	123	408	1			4		59	1	70	2	1,683
Tennessee	April 1		582	3		204	1	453		179	152		8				79	26	23	3	6,506
4 Mos.			2199	13	8	793	4	1579	1	744	625		44		3		276	79	111	6	5,723
Texas	April 1		2																		



# IT TAKES THE **EXTRA POWER** OF **FEDERAL Trucks** TO MOVE BIG LOADS . . .



More power for bigger payloads . . . that's what every truck owner wants today. And, that's exactly what you get with new, extra-sturdy, extra-powerful Federals! You profit by the fact that Federal Heavy-Duty Trucks are all-truck, all the way through. Designed right . . . built right . . . powered right . . . Federal Trucks are backed by more than 42 years of

specialized truck building experience. This experience adds up to greater operating economy, lower maintenance cost and bigger payload profits for you. You'll find a wide range of models, both gasoline or diesel powered, with gross ratings to 90,000 lbs., designed to meet your most exacting requirements. Write for illustrated booklet today!

FEDERAL MOTOR TRUCK COMPANY • DETROIT 9, MICH. U.S.A.

## FEDERAL



## TRUCKS

# Vehicle Operating Costs of the U. S. Government

## Gasoline Consumption—Average Miles Per Gallon

DEPARTMENT OR AGENCY	All Auto-mobiles	Buses for Eleven or More Passengers	TRUCKS—GROSS VEHICLE WEIGHT								Truck Tractor	Total Number Vehicles in Fleet
			Less than 10,000 (Under 1 Ton)	10,000 to 12,499 (1 Ton)	12,500 to 14,999 (1½ Ton)	15,000 to 16,999 (2 Ton)	17,000 to 20,499 (3 Ton)	20,500 to 24,499 (4 Ton)	24,500 to 28,499 (5 Ton)	Over 28,500 (Over 5 Ton)		
Department of the Treasury	13.8	7.7	12.6	8.0	7.0	5.3	6.0	5.0	4.9	5.9	4.9	4,284
Department of Justice	13.4	6.4	12.2	10.8	6.8	5.1	5.3	4.6	3.7	3.6	5.3	4,143
Post Office Department	9.0	—	8.6	6.2	5.4	3.8	4.6	—	2.8	—	2.8	15,803
Department of the Interior	15.8	6.8	13.0	10.0	8.0	6.4	5.8	4.1	4.6	2.5	3.6	19,131
Department of Agriculture	16.0	6.6	14.1	11.3	7.6	7.3	6.1	4.4	5.4	5.2	4.9	20,870
Department of Commerce	15.4	7.9	14.7	10.8	7.7	6.0	6.0	5.5	7.0	3.1	6.4	4,629
Atomic Energy Commission	13.0	5.7	10.4	7.7	6.1	7.2	4.1	4.0	2.7	2.7	3.8	7,965
Federal Security Agency	15.2	10.6	11.9	8.9	7.2	5.4	5.4	6.5	4.5	—	5.0	3,244
Housing & Home Finance Agency	11.9	—	10.1	7.0	3.7	5.0	4.7	—	5.7	—	—	2,386
Tennessee Valley Authority	15.9	—	11.9	—	—	7.7	—	—	—	4.0	3.9	2,352
Veterans Administration	15.6	6.1	11.3	9.2	6.0	5.5	4.3	3.1	2.8	2.6	5.7	2,978
Average Miles per Vehicle	10,775	9,096	7,503	8,480	6,105	5,239	7,977	3,414	3,816	3,010	3,998	—
Average Miles per Gallon	14.1	7.2	11.9	9.0	6.5	5.9	5.2	4.6	4.4	3.7	4.6	—

## Average Maintenance Cost Per Mile

DEPARTMENT OR AGENCY	All Auto-mobiles	Buses for Eleven or More Passengers	TRUCKS—GROSS VEHICLE WEIGHT								Truck Tractor	Total Number Vehicles in Fleet
			Less than 10,000 (Under 1 Ton)	10,000 to 12,499 (1 Ton)	12,500 to 14,999 (1½ Ton)	15,000 to 16,999 (2 Ton)	17,000 to 20,499 (3 Ton)	20,500 to 24,499 (4 Ton)	24,500 to 28,499 (5 Ton)	Over 28,500 (Over 5 Ton)		
Department of the Treasury	.015	.069	.018	.018	.030	.042	.065	.059	.090	.035	.080	4,284
Department of Justice	.014	.033	.012	.011	.011	.029	.020	.021	.064	.021	.039	4,143
Post Office Department	.071	—	.036	.052	.050	.117	.069	—	.032	—	.107	15,803
Department of the Interior	.012	.032	.016	.024	.032	.032	.052	.076	.072	.173	.114	19,131
Department of Agriculture	.010	.021	.013	.025	.044	.042	.063	.066	.071	.082	.102	20,870
Department of Commerce	.009	.020	.009	.014	.025	.031	.023	.012	.036	.058	.022	4,629
Atomic Energy Commission	.021	.055	.029	.036	.047	.030	.092	.057	.098	.100	.086	7,965
Federal Security Agency	.011	.029	.010	.010	.028	.069	.083	.011	.086	—	.065	3,244
Housing & Home Finance Agency	.020	—	.026	.036	.053	.066	.042	—	.081	—	—	2,386
Tennessee Valley Authority	.014	—	.023	—	—	.048	—	—	—	.074	.072	2,352
Veterans Administration	.017	.049	.021	.026	.050	.066	.070	.065	.065	.118	.103	2,978
Average Miles per Vehicle	10,775	9,096	7,503	8,480	6,105	5,239	7,977	3,414	3,816	3,010	3,998	—
Average Maintenance Cost per Mile	.019	.039	.019	.025	.037	.052	.058	.046	.069	.082	.079	—

## Average Tire Cost Per Mile

DEPARTMENT OR AGENCY	All Auto-mobiles	Buses for Eleven or More Passengers	TRUCKS—GROSS VEHICLE WEIGHT								Truck Tractor	Total Number Vehicles in Fleet
			Less than 10,000 (Under 1 Ton)	10,000 to 12,499 (1 Ton)	12,500 to 14,999 (1½ Ton)	15,000 to 16,999 (2 Ton)	17,000 to 20,499 (3 Ton)	20,500 to 24,499 (4 Ton)	24,500 to 28,499 (5 Ton)	Over 28,500 (Over 5 Ton)		
Department of the Treasury	.003	.007	.003	.001	.004	.009	.011	.006	.011	.003	.006	4,284
Department of Justice	.002	.005	.002	.002	.005	.007	.003	.002	.004	.006	.011	4,143
Post Office Department	.003	—	.004	.004	.004	.005	.002	—	.005	—	.001	15,803
Department of the Interior	.003	.011	.003	.003	.007	.008	.012	.025	.016	.025	.018	19,131
Department of Agriculture	.002	.037	.002	.003	.006	.006	.015	.009	.017	.012	.017	20,870
Department of Commerce	.002	.003	.002	.004	.004	.006	.008	.001	.002	.015	.003	4,629
Atomic Energy Commission	.002	.006	.002	.003	.003	.003	.007	.004	.014	.006	.008	7,965
Federal Security Agency	.002	.004	.001	.002	.004	.009	.023	—	—	—	—	3,244
Housing & Home Finance Agency	.003	—	.003	.004	.016	.004	.010	—	.009	—	—	2,386
Tennessee Valley Authority	.002	—	.004	—	—	.009	—	—	—	.013	.012	2,352
Veterans Administration	.010	.006	.001	.001	—	.002	.009	.010	.031	—	—	2,978
Average Miles per Vehicle	10,775	9,096	7,503	8,480	6,105	5,239	7,977	3,414	3,816	3,010	3,998	—
Average Tire Cost per Mile	.002	.010	.002	.003	.006	.006	.010	.008	.012	.011	.010	—



The "Steering Engineers" at Thompson's Detroit Division had a big part in bringing to the automotive industry the first major improvement in front wheel suspension in 20 years—Ball Joint Suspension.

The benefits are many—more space under the hood for wider engines . . . eliminates front suspension bind . . . gives better steering and handling . . . increases service life many times . . . greatly reduces front end overhaul time . . . reduces lubrication points from 12 to 4 per car . . . cuts assembly time—on production line or in garage . . . eliminates removing front wheels,

## ENGINEERED STEERING BY THOMPSON...



bushings, draining brakes and realigning wheels when servicing the front end.

This is only one of many improvements in which Thompson's steering engineers have had a major part. Let us solve your steering problems. Our research, experience and manufacturing facilities are always at the disposal of *all* automotive manufacturers. Call us at WA 1-5010, Thompson Products, Inc., DETROIT DIVISION, 7881 Conant Ave., Detroit, Michigan.

The new ball joint suspension, developed by Thompson Products and Ford Motor Company engineers, made its first public appearance as standard equipment on all 1952 Lincoln car models. It is the most advanced improvement in front end suspension in 20 years.





# Olson Bodies Now on Ford

THE Olson aluminum-alloy bodies are now available on Ford F-3 and F-5 parcel delivery chassis. Available is a 310 cu ft job that weighs 879 lb exclusive of the rear bumper, a 440 cu ft body that weighs 1400 lb and a 360 cu ft body weighing 1175 lb.

The 310 cu ft body is built on the

104-in. wheelbase F-3 chassis. The load space is 98 in., width 78 in., and height 70 in. A payload is promised around 2900 lb maximum. There is a 31-in. sliding door with roller-type windows.

The 440 cu ft model is 12 ft long, available on the F-3 which has a 122-in. wheelbase. This unit is designed



to accommodate a 2417-lb payload without exceeding the axle, spring or tire ratings. This payload is said to exceed by 1000 lb the permissible payload of other forward control bodies on the same chassis. The 12-ft body will also be available on the Ford F-5 parcel delivery 134 in. wheelbase chassis for weights up to 7600 lb.

The 10-ft body has 360 cu ft of load-space, available on the F-3 chassis. This body can accommodate 2800 lb, according to the manufacturer, on 750 x 17 eight-ply tires.

The aluminum in the bodies is of aero-type shell construction. The side panels, skirts and rear panels are of 1/8-in. plate, mounted without posts or ribs. No linings are required. The floors are of thick aluminum plate, supported by aluminum cross members. The underbodies are insulated and coated. A choice is offered between 38-in. and 58-in. double rear doors. Another option is full-width, square-back double doors. The side panel skirts are removable without disturbing the main side panels or the body paint or lettering.

## Trailmobile Trophy Winner



As an added crown to his national recognition for courtesy and safe driving on the highway, Allen C. Sagerhorn, ATA's "Driver of the Year," receives the coveted Trailmobile Trophy from Ralph B. George, eastern sales executive of Trailmobile, Inc., as G. D. Sontheimer and Mrs. Sagerhorn look on. Mrs. Sagerhorn received a home freezer from Trailmobile at the same time. Mr. Sagerhorn drives for Consolidated Freightways, Portland, Ore., out of the Fargo, N. D., terminal. He was also the "Driver of the Year" for North Dakota, 1951.

COMMERCIAL CAR JOURNAL, July, 1952

**LISTEN to Your Compressor...**  
*too frequent running costs you money!*

**Exclusive  
PLATE VALVES  
CUT RUNNING TIME!**

Champion's Aero-Dynamic Design includes specially designed, quiet, quick-acting wear-resisting plate valves located at the top of the domed cylinders. They are important because they insure straight-line air flow, minimum running time, longer compressor life and lower maintenance costs. Like Champion's exclusive domed pistons and cylinders, automotive type connecting rods and bearings and separate crankthrows for each connecting rod, the special plate valves are superior engineering points that defy comparison.

Listen to your compressor . . . if it is running too frequently it is costing you money by slowing down your air operated tools, taking up mechanic's valuable time and running up electrical costs. See your Champion Jobber today or write for free copy of the informative Champion Catalog Now!

**CHAMPION PNEUMATIC MACHINERY CO.**  
829 No. Pleasant St., Princeton, Illinois

**CHAMPION**  
**AIR COMPRESSORS**

CAR WASHERS • AIR HOSE REELS • SERVICE TOWERS • CEILING SWIVELS

# Exide

## ULTRA START BATTERY

### BUILT TO LAST LONGER

Get top returns from your battery investment! Equip your trucks with the fleet owner's battery—the sensational new Exide ULTRA START. You can count on it for longer battery life... improved performance... extra low cost per mile of operation... greater all-round battery value.

#### THREE GREAT LONG-LIFE FEATURES

**SILVIUM**—new grid alloy, lengthens battery life because of high resistance to grid corrosion—a battery's most destructive enemy.

**G. O. X.**—new active material—makes possible the use of a lower specific gravity acid solution that promotes longer efficient battery life.

**PORMAX**—new, practically indestructible plastic separators increase cold-weather starting ability—resist heat and acid—are flexible and tough.


**PLUS**—Vitrex Retainers... Element Protector... Plastic Connector Shields... Plastic Vent Caps... Improved Sealing Compound... Shock-resistant Container.

**INVESTIGATE NOW!** Learn why the long-life ULTRA START is your best battery buy... at any price.

THE ELECTRIC STORAGE BATTERY COMPANY  
Philadelphia 2

*Exide Batteries of Canada, Limited, Toronto*

1888... DEPENDABLE BATTERIES FOR 64 YEARS... 1952



**WHEN IT'S AN EXIDE  
...YOU START**

"EXIDE" "PORMAX" "SILVIUM"  
and "VITREX" Reg. U.S. Pat. Off.  
"ULTRA START" T.M. Reg. applied for

# Efficiency Improved by Gasoline Dispensing System

CONVENIENCE and efficiency are provided in a new gasoline dispensing set-up for the W. Arthur & Co., Inc., Janesville, Wis., which uses 350 trucks and other units in hauling automobiles

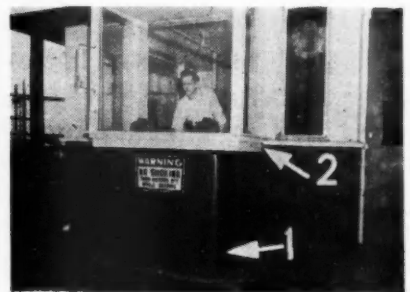
in a seven-state area for the Janesville division of Chevrolet.

Located on a 10½-acre tract of land adjacent the Chevrolet assembly plant, the W. Arthur firm has a two-story

office building outside the fenced-in acreage, with a dispatcher's office on the north side (rear) of the structure. All trucks must pass this dispatcher's office going in and out of the fenced-in area and take on gasoline, log cards and orders.

Two 10,000-gal underground gasoline storage tanks are located on the opposite side in front of the office building, so that they can be filled regularly by oil company tank trucks, without obstructing the constant coming and going of the carriers.

Gasoline is then pumped from the underground storage tanks through 2½-in. pipe lines by pumps located under a glassed-in alcove in front of the dispatch office (1). There is a slab



of concrete above the pumps (2), with the meter for each pump above the concrete, inside the glassed-in office. This was necessary to meet the state code requirements for safety.

The pumps then push the gasoline out 20 ft to two take-on hoses at a concrete island. When a driver comes up and lifts the hose off a button contact, the pumps start working and when he takes on the gas, the meters operate in the office.

Thus the dispatcher enters on a special form the amount of gas taken on, the number of the truck, the time, and also the name of the driver. He can have all this information recorded by the time the driver finishes taking gas. Two big truck units can take on gas

(TURN TO PAGE 90, PLEASE)



"Offhand, I'd say about seven cents worth!"

COMMERCIAL CAR JOURNAL, July, 1952

## TIRE HEAT PROBLEM?

*Insure Airtight Tire Valves*

**USE...**

**No. 100-AH**  
Valve inside with special heat-resisting rubber in cup and on barrel.



**No. 632**  
Dome-type cap with swivel gasket of special heat-resisting rubber.



**No. 631**  
Hexagon-type cap with lead gasket mounted over brass sleeve.



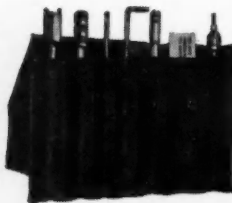
**HI-TEMP** Heat Resisting  
VALVE INSIDES AND CAPS  
Developed by **DILL**

Stop costly road delays caused by tire trouble. Under abnormal hot tire temperatures, even up to 300°F and more, Dill HI-TEMP valve insides and caps keep tire valves airtight. High temperatures will not injure the special Dill heat-resisting air seal. Dill HI-TEMPS are helping fleet owners, everywhere, to maintain schedules and save tire wear. Be sure to get this money-saving equipment, today, from your wholesaler, tire or oil company.

**THE DILL MANUFACTURING COMPANY**  
700 East 82nd St., Cleveland 3, Ohio

### HANDY SERVICE TOOLS FOR TRUCK AND BUS TIRES

This handy kit of long-handled tools will save time for your tire serviceman. Each tool is specially designed (approx. 8½" long) to reach inner dual tires for removing and replacing valve insides and making necessary repairs on valve stems. The complete set comes in a leather pouch with snap button lock, and fits handily in pants, coat or jacket pocket.



**No. 5200 TOOL SET** in Handy Leather Pouch Includes These Tools  
No. 5201 Valve Inside Insertor and Extractor  
No. 5202 Valve Cap Tool  
No. 5203 Valve Inside "Easy-Out"  
No. 5204 Valve Stem Refacer  
No. 5205 Valve Stem Seat Cleaner  
No. 5206 Valve Stem Rethreader

ORDER from your Wholesaler, Tire or Oil Company

**DILL**

*Standard of the Tire Industry*

TIRE VALVES AND ACCESSORIES





# **BRAKE BLOCKS**

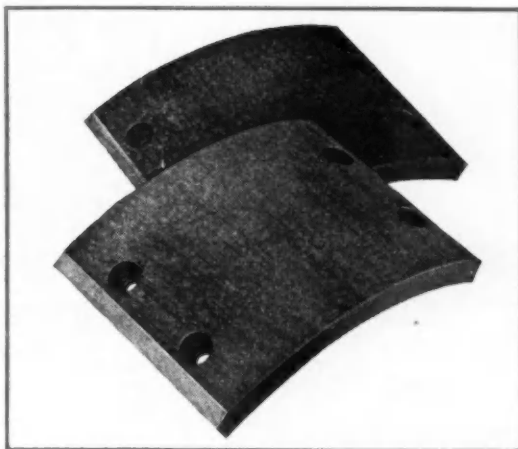
## **mean less heat checking**

Heat checking, which in turn leads to costly drum cracking, can be reduced by using RAYBESTOS BRAKE BLOCKS in the correct combinations. This fact has been demonstrated time and again by extensive proving ground and dynamometer tests, and substantiated by thousands of fleet operators.

Raybestos Blocks offer you other big advantages, too: longer brake block life, fewer brake adjustments, reduced maintenance costs, lower costs per mile.

Additional assurance of better fleet performance can be gained by use of Raybestos Ray-Lok and Ray-Metl Clutch Facings. They have no equal for smooth engagement and long life.

For specific recommendations relative to your equipment and operation, a trouble-shooting chart, and complete technical information, ask your jobber salesman to get you Raybestos Fleet Engineering Service.



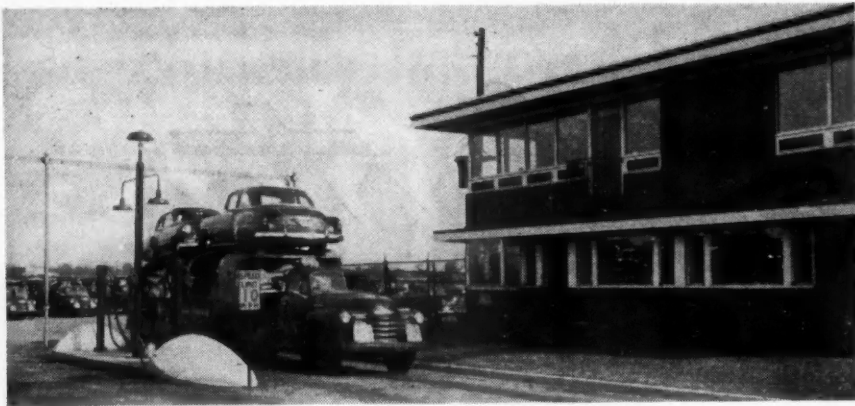
Raybestos PGT Sets provide specially engineered linings for medium and light-duty trucks that don't use blocks. They are factory packaged in the right combinations to give lower cost per mile results.

**50 YEARS OF SERVICE...50 YEARS OF PROGRESS...1902-1952**



**RAYBESTOS DIVISION of Raybestos-Manhattan, Inc., Bridgeport, Conn.**  
**MANUFACTURERS OF AMERICA'S BIGGEST SELLING BRAKE LINING**

RAYBESTOS-MANHATTAN, INC., Manufacturers of Brake Linings • Brake Blocks • Clutch Facings • Radiator Hose • Fan Belts • Mechanical Rubber Products • Rubber Covered Equipment • Packings • Asbestos Textiles • Sintered Metal Products • Abrasive and Diamond Wheels • Bowling Balls



## Dispensing System

Continued from Page 88

at one time, for there are two meters in the office.

Each truck has two safety reserve gasoline tanks, with a total gas carrying capacity of about 95 gallons. This hauling company uses about 3000 to 4000 gals. of gasoline each day. The vent pipe for the two underground tanks is run up the side of one building to the second-floor roof.

Midway between the underground tanks and the dispatch area pumps are a set of valves, which can be set to enable the two pumps to draw from one tank. They are necessary when gasoline supplies run low between visits of tankers.

Formerly, when the W. Arthur Co. built its new plant, the gasoline was dispensed in a safety lane building area deep in the 10½-acre tract. Despite the large amount of room at that point, there were waste time and extra steps necessary for every truck before it took off. Under the present system, the driver takes on gasoline, the information is recorded immediately and he can pick up orders and his log without any waste of time.

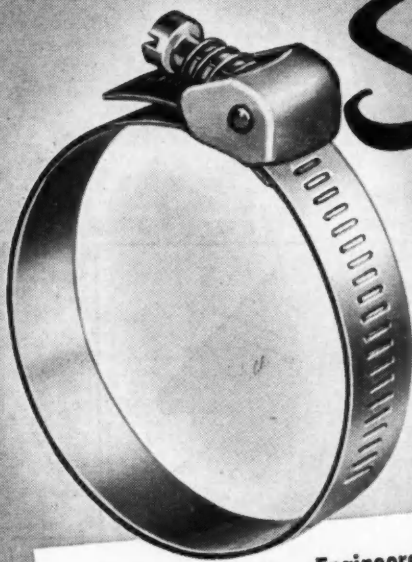
The safety lane building, however, is still put to good use. It takes in every truck which has traveled more than 100 miles, for a thorough safety check. In addition, the firm has a downtown repair shop in Janesville.

### Mid-States Goes LP



The first International LP-205 to be delivered in Chicago goes to Mid-States Freight Lines Inc. Shown here fueling for its initial run to Cleveland, managers and executives of Mid-States and International Harvester Co. look on. Shown (left to right) are: Cecil Vernon, president; R. J. Martin, vice president; Jess Chaffin, serviceman; John Ferguson, operations manager, all of Mid-States, and I. E. Turmo, assistant district manager at International's Chicago office.

What made



# Snaplock

the worm drive  
hose clamp leader  
**SO FAST?**

**TOP QUALITY** — Engineered to aircraft specifications  
...Stainless Steel band — Stainless Steel housing  
**TOP EXPERIENCE** — Made by the oldest and the largest  
manufacturer of hose clamps  
**TOP ACCEPTANCE** — Sales upped 500% in one year ...  
now the choice of leading distributors throughout the country

"MAKE IDEAL YOUR SINGLE SOURCE FOR ALL HOSE CLAMPS"

*performance  
guaranteed  
since 1913*

**ideal**  
Corporation  
BROOKLYN 7, N.Y.

## CCJ News Reports

Continued from Page 31

### Federal Highway Aid

The House has approved, 191-30, and sent to the Senate H. R. 7340 authorizing \$550 million in federal aid to highway construction in each of the next two fiscal years. Each state would be required to match the amount of aid it receives.

The bill also authorizes federal expenditures of \$81,450,000 in each fiscal year for forest highways, park roads, parkways and Indian roads.

For fiscal 1953 only, the bill further provides \$12 million for access roads.

### Highway Safety Group Planned

Secretary of Commerce Charles Sawyer informed President Truman that he will establish an advisory committee of business and industrial executives to examine the problem of the nation's highway accident rate and to recommend measures for reducing it. As General Chairman of the President's Highway Safety Conference, Secretary Sawyer reported that he is calling a meeting of the Conference in Chicago October 17 and 18. The representatives of this new advisory committee, as well as officials and supporting groups from each of the 48 states, will be invited to the Chicago conference.

Purpose of the October meetings will be to determine what progress has been made in the program backed by the Conference and to devise further means for getting the program more widely applied, the Secretary said.

### Wages Increase 10½ Cents

Hourly wage rate increases in the nation's trucking industry averaged ten and a half cents during 1951, according to an analysis of wage settlements by the American Trucking Associations, Inc. Escalator clauses tying wages to the BLS Consumers' Price Index were incorporated in six agreements; deferred wage increases were found in 21.

Fringe benefits showed a tendency to decrease in importance during 1951, ATA's Industrial Relations Department which issued the analysis said. Only 134 of the 289 agreements provided for additional fringes. The data showed that the 289 agreements used for the study were composed of 22 over-the-road, 10 tank-truck, 128 local cartage, 48 maintenance, 33 movers, 9 office workers, and 39 miscellaneous agreements.

### Clarification on ICC Regs

At several meetings where the new ICC Safety Regulations have been discussed (CCJ, June, page 67), confusion has developed as a result of the specific exemption for local driving contained in rule 195.8. In this section, drivers operating wholly within a radius of 50 miles from their terminal are exempt from the daily log requirements.

Since this is the only specific exemption of this kind, the question naturally arises—what about local drivers and the newly stiffened physical requirements,

(TURN TO NEXT PAGE, PLEASE)

# the Muffler Inside

AP's sensational new muffler which introduces "fenced-in" silencing—an entirely new principle of shell construction—is the latest of a long series of AP "firsts" in muffler improvements. This simple but startlingly effective method of silencing today's high compression engines eliminates asbestos-wrapped makeshifts. It is another in a long list of AP features such as deeper crimp-locked seams, stronger spun heads, low and high frequency tuning chambers, 26 gauge liners, 22 gauge shells, extruded holes to resist clogging, electrically welded construction, 16 gauge outer heads on ovals.

Ask your jobber for details of AP's "fenced-in" silencing.

**THE AP PARTS CORPORATION**

1185 AP Building • TOLEDO 1, OHIO

Manufacturers of: MUFFLERS • PIPES • MIRACLE POWER • dgf 123



# Mufflers



## CCJ News Reports

Continued from Page 95

including periodic re-examinations? Must old drivers be barred from operating a vehicle, even in local service, if they cannot meet the new requirements?

The answer lies in section 190.33 which contains the same applicability chart found on page 96 of the old regulations. According to this chart, "Vehicles and drivers used in transportation wholly within a municipality of between contiguous municipalities or

## 1952 Domestic Truck Factory Sales by G.V.W.\*

	5,000 lb. and less	5,001-10,000	10,001-14,000	14,001-16,000	16,001-19,500	19,501-26,000	26,000-28,000	Over 28,000	Total
January.....	30,803	15,649	4,673	16,666	4,909	8,323	3,971	85,194	
February.....	30,518	15,506	5,055	17,416	3,856	8,239	4,080	84,670	
March.....	34,151	16,896	5,037	18,104	3,843	9,290	4,712	92,033	
April.....	38,783	19,614	4,743	17,358	3,401	9,241	4,451	97,591	
Total—Four Months—1952.....	134,255	67,665	19,708	69,544	16,009	35,093	17,214	359,488	
Total—Four Months—1951.....	197,880	84,610	33,781	68,316	19,088	23,067	13,072	439,614	

\* Automobile Manufacturers Association.

within a zone adjacent to and commercially apart of such municipality or municipalities" are subject only to Part 195 (Hours of Service) unless they are transporting explosives or other dangerous articles.

## 1952 Truck Trailer Shipments\*

	March	Three Months
<b>Vans</b>		
Insulated and refrigerated.....	337	809
Steel.....	84	201
Aluminum.....	253	608
Furniture.....	102	354
Steel.....	102	354
Aluminum.....	102	354
All other closed-top.....	1,452	4,160
Steel.....	972	2,382
Aluminum.....	480	1,768
Open-top.....	241	675
Steel.....	136	329
Aluminum.....	105	346
Total—Vans.....	2,132	5,986
<b>Tanks</b>		
Petroleum.....	375	1,252
Food.....	34	85
L.P.G.....	22	48
All other.....	45	139
Total—Tanks.....	476	1,524
<b>Pole, pipe and logging</b>		
Single axle.....	62	197
Tandem axle.....	148	314
Total.....	210	511
<b>Platforms</b>		
Racks, livestock and stake.....	575	1,341
Grain bodies.....	147	357
Flats (all types).....	641	1,617
Total—Platforms.....	1,363	3,315
<b>Low-bed heavy haulers.....</b>	465	1,164
<b>Dump trailers.....</b>	64	180
<b>All other trailers.....</b>	165	748
Total—Complete trailers.....	4,875	13,490
<b>Converter dollies.....</b>	34	103
<b>Trailer chassis.....</b>	354	896
Total—Trailers and Chassis.....	5,273	14,449

\* Industry Division, Bureau of the Census.

## Farley is GMC Dealer

The GMC truck dealership at 603 West 23rd St., New York City, has been sold to the newly organized Farley-GMC Truck Co., Inc., with James A. Farley, former U. S. Postmaster General, as president.



Mr. Farley is shown exchanging congratulations with W. L. Vande Water, eastern regional sales manager (trucks) of the GMC Truck and Coach division.

END

Please Resume Reading Page 37

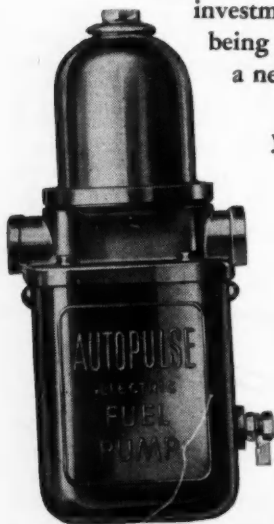
COMMERCIAL CAR JOURNAL, July, 1952

**you're  
being  
robbed!**

*when your drivers light*

*these*

Your profits are being wasted when your drivers light these flares by the roadside. Add up the interest on your investment, overhead, idle men being paid — every hour lost is a needless drain on your income.



Install Autopulse Electric Fuel Pumps and you can forget a frequent cause of lost time, stalling due to vapor lock. Autopulse can be installed anywhere between the fuel tank and the carburetor, does not need to be placed right over the hot engine, and because it is a *pusher pump* and does not draw the fuel to the engine it keeps your vehicles on the job. In the hot summer weather or in the dead of winter you are sure of instant starting — you can meet deliveries "on the nose." See your Autopulse dealer today • or write for illustrated folder.

*install an Autopulse electric fuel pump*

**AUTOPULSE** *the heart of your motor*

AUTOPULSE CORPORATION 218 E. Dowland St., Ludington, Mich.

Total  
85,184  
84,670  
92,033  
97,881  
359,408  
439,814

ents\*  
Three  
Months  
609  
201  
608  
354  
354  
4,180  
2,392  
1,708  
675  
329  
348  
5,998

1,282  
85  
48  
139  
1,524

187  
314  
511

1,341  
357  
1,617  
3,315

1,164  
190  
748

13,450  
103  
896  
14,446

at 603  
as been  
Farley-  
mes A.  
er Gen-



ing con-  
Water,  
trucks)  
division.

e 37

uly, 1952

ough on Oil-Pumping

GENTLE

on  
cylinder  
walls



**GENTLE because** Steel-Vent's two wall-contacting steel sections have rounded edges which provide hairline contact and reduce drag to a minimum.

**GENTLE because** the Steel-Vent spacer has extra wide vents that let oil flow through freely for extra cylinder wall lubrication.

**GENTLE because** Steel-Vent's flexible, low-tension inner spring works only against the steel sections—holds them on the cylinder wall with soft pressure. Result: maximum life, minimum wear.

**HASTINGS**

**STEEL-VENT PISTON RINGS**

*Right for re-bore, re-ring, re-sleeve*

HASTINGS MANUFACTURING CO., HASTINGS, MICHIGAN  
HASTINGS LTD., TORONTO

Piston Rings, Spark Plugs, Oil Filters, Caste, Drou



# How to "Heavy-up" Leaf Springs

Continued from Page 60

Length of Spring in In.	Load Carrying Capacity in Lb. per Leaf for Each Inch of Width						
	1/4 Thick	3/8 Thick	1/2 Thick	5/8 Thick	3/4 Thick	7/8 Thick	1 Thick
30	83	105	130	157	187	255	332
35	72	90	112	135	160	218	286
40	63	79	98	118	140	191	250
45	56	70	87	105	125	170	222
50	50	63	78	95	113	153	200
55	46	58	71	86	102	139	182
60	42	53	65	79	94	128	167
65	39	49	60	73	87	118	154

Fig. 2. Load carrying capacity can be figured in terms of stress. For example, if in a spring 50 in. long by 3 in. wide, you want to add one 3/8 in. leaf, its carrying capacity will be 3 times 113 lb or a total of 339 lb

front eye to the center of the rear eye, and then measuring from the center straight edge to the surface of the main leaf) may be difficult to use accurately.

"One method in practical use, consists of using a channel steel beam, (such as used for many lifts or hoists); or a smooth, even floor that is approxi-

mately level, as the base surface from which to measure, the distance to the front spring eye 'A,' Fig. 3 and the distance to the rear spring eye 'B.' Then add and divide by two, since these distances will usually be different. Measure 'Z,' the distance to the top of middle of the main leaf and

subtract it from the average of 'A' and 'B' to obtain the arch 'X.'

"After loading up the truck, bring it back to the same place and subtract 'Z' from the average of 'C' plus 'D' to obtain arch 'Y.' Subtract arch 'Y' from arch 'X' and this will give the actual deflection. (The deflection of the tire, although included in the above result, is usually negligible, provided proper tire inflation is maintained.)"

The SAE defines spring deflection "Rate" as—"Half the difference between the loads (rapped compression loads) measured 1 in. above and 1 in. below, the specified load positions." (That gives the rate per inch.)

If an additional load of 8000 lb placed on the truck gives an additional deflection of 2 in., then (since there are two rear springs) we should divide 8000 lb by 2 springs (to get the added load on each spring) and then divide the resulting load of 4000 lb by the 2-in. deflection, giving a deflection rate of 2000 lb per in.

Another spring manufacturer reports, "Most fleet operators increase the capacity of the springs whenever they feel the truck will be hauling excess loads from day to day. The extent (TURN TO PAGE 101, PLEASE)



# AM

## TRAILER

\* ALUMINUM-MAGNESIUM

IT IS DURABLE IT IS LIGHT IT CARRIES NO  
GREAT PREMIUM PRICE IT INCREASES THE PAY LOAD

KENTUCKY MANUFACTURING COMPANY R. C. Tway Company, Incorporated, Owner  
2601 SOUTH THIRD STREET, LOUISVILLE 8, KENTUCKY



## Leaf Springs

Continued from Page 98

of the modification is often based upon past experience with their trucks. Or they may consult a local spring service shop which is in a position to make the proper recommendations. In the manufacturer's own spring service stations, they test the springs for carrying capacity—if there is any doubt—before making the installation on the truck. A conventional spring testing machine, as shown in Fig. 4, gives the rate of deflection.

### Consider the Chassis

THERE are many truck owners who give their drivers every consideration, and they do not want the springs rebuilt with too much extra capacity. Where loads are variable, there is no way to adjust the capacity—except by a complete redesign, incorporating the progressive type of leaf spring.

Some spring manufacturers believe that fleet operators can go as far in the modification of the springs as the other parts of the truck will permit. However, the springs should be designed to absorb road shocks—rather than to transmit them to the chassis frame. The prime function of the springs is to act as a safety device (like a fuse) to protect other parts of the vehicle.

Instances can be quoted where springs have been "heavied-up" to such an extent that the stiffer springs have torn the spring hangers off the frames, broken the spring shackles, or even cracked the frames.

One well-known fleet operator, when considering heavying-up springs, first

tests the springs to ascertain their deflection rate. Then he writes to the axle manufacturers and the transmission makers to find out whether their equipment is recommended to stand up under heavier loads.

While it is easy to add additional plates, to heavy-up the springs themselves, it is seldom practical to alter the spring hangers, the spring shackles or the axles. And they are all links in the same chain. Chassis frames are sometimes reinforced with fish plates but, when this is done, the springs may require a complete redesign.

When adding leaves, it is usually desirable to add the longer leaves, since the longer leaves contain more metal and more metal does more work. However, since the No. 2 leaf of truck springs is usually wrapped around the spring eye as a safety factor, the added leaves will usually begin with No. 3 leaf, and then No. 5 leaf—if only two leaves are added to the main spring.

The chief engineer of an eastern spring manufacturer says that a few points, which may not have been ex-

(TURN TO NEXT PAGE, PLEASE)

## POSITIONING PROBLEM? An AEROL product will solve it!

### YOU'LL CONTROL YOUR LOADS—Safely— with an AEROL LIFT KIT

#### CLAYBORNE LIFT KITS ARE NOW

**AEROL PRODUCTS**—Special kits are available for Chrysler, Ford, Chevrolet, Kaiser-Frazer, Nash, Studebaker and General Motors units; Universal model for all popular passenger car and most truck engines. This is one of eight basic kits and almost limitless combinations of parts available for every lifting need—for engines, heads, transmissions—for plate, beams, pipe, etc.—in automotive and industrial shops.



Scientifically designed to permit proper balancing of heavy and bulky loads, AEROL Lift Kits help make possible new standards of shop safety.

The weight-distributing beam and all other AEROL Lift Kit parts are specially hardened for strength and, in addition, have an ample safety margin beyond the safe working load stamped into its most vulnerable parts.

Why take chances with ropes, cables, log chains and improvised slings of questionable strength? Get an AEROL Lift Kit—or AEROL Lift Parts—and do your lifting scientifically and safely.

AEROL Lift Kits are made by The Cleveland Pneumatic Tool Company, and are sold only through jobbers. Distributed in Canada by Vic Mathewson Company, Limited, Toronto 14, Ontario.



**THE CLEVELAND PNEUMATIC TOOL CO.**  
Automotive Division, Dept. K  
3769 E. 77th Street Cleveland 5, Ohio  
Please send me a copy of the new AEROL catalog.

Name \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_



"They sure make it tough to quit this joint."

COMMERCIAL CAR JOURNAL, July, 1952

# 1,500,000 lbs. of Meat

handled weekly by  
**Motor City Cartage Co.**

Detroit, Michigan



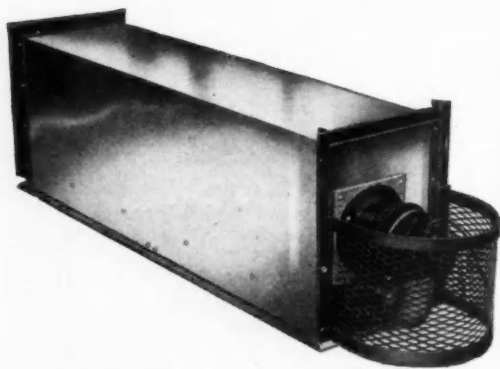
A Portion of the Fleet of Motor City Cartage Co.

"We are pleased to say that Foster-Built Dry Ice Bunkers did a very good job for us when tested in some of our equipment last year. On the basis of these tests we have decided to install Foster-Built Bunkers in all of our equipment. We feel that Foster-Built is the solution to our refrigeration requirements in the distribution of over 1½ million pounds of perishable meat each week."

Al. Scott, and Son, Dick Scott  
Motor City Cartage Co., Detroit, Michigan

## PROTECTED WITH

# Foster-Built <sup>Dry Ice</sup> Bunkers



### Low Installation Cost

Simple to install, Foster-Built Bunkers need only the placement of four studs and a quick wiring operation to be ready for service — and they can be removed in minutes when refrigeration isn't needed.

**Get the Facts today**

### Fully Dependable • Lowest Cost

Foster-Built Dry Ice Bunkers give dependable, sure truck refrigeration at only a small fraction of the cost of expensive mechanical refrigeration units. Foster-Built Bunkers have only one moving part—a low amp fan effectively forces air along a highly chilled metal plate—circulating freezing air throughout the truck body.

### Lowest Operating Cost

Sturdy, simple design means no expensive repair bills — Foster-Built Bunkers have no complicated mechanism to break down. Real dry ice "misers," Foster-Built Bunkers give the maximum refrigeration per pound of dry ice. Why not solve your truck refrigeration problems with Foster-Built Bunkers?

Foster-Built Bunkers, Inc.  
757 W. Polk Street, Chicago 7, Illinois  
Gentlemen: Please send me free:  
☐ Case Histories of Foster-Built Dry Ice Bunkers Booklet.  
☐ Dry Ice Warehouse List.

Name.....

Company.....

Address.....

City..... Zone..... State.....

## Leaf Springs

Continued from Page 101

pressed by the others include:

(a) Assuming the capacity of the spring is to be increased, additional leaves may be added to permit approximately the same deflection (under the increased load) as was obtained under the rated load by the use of the original springs.

(b) Care should be taken when adding leaves, not to exceed the thickness of the steel in the original leaves designed into the spring. In this way the maximum stress will not be excessive.

Another chief engineer of a spring manufacturing company says that the fleet operators may have many different ideas as to how much the springs may be reinforced. But in the spring trade, generally, there are offered "build-up" kits, providing for two leaves in the main spring and one leaf in the auxiliary or helper spring—or three leaves in the main spring and two leaves in the helper spring.

The addition of the "two-and-one" build-up kit will normally increase the capacity of the springs approximately 15 per cent, while the "three-and-two" build-up kit will increase the capacity of the springs about 25 to 30 per cent.

In most instances, the spring manufacturer, aside from supplying the original equipment spring, is also in a position to offer an exact replacement which will function within the original limits provided for in the original design.

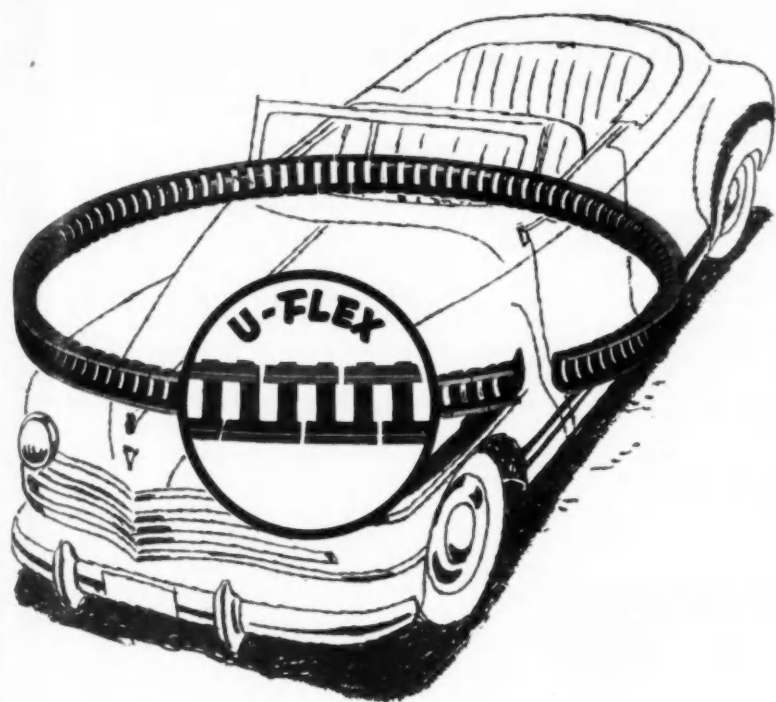
### Springs Protect the Vehicle

AGAIN quoting a fleet operator, it is much better practice to have the length of the leaves "graded"—when additional leaves are added. The purpose of grading is to provide the greatest support as we approach points of maximum stress. Otherwise, parts of the spring which are unduly stiff will transfer part of their stresses to parts which are more resilient, causing overworking of these weaker parts and eventual breakage.

We usually think of the springs as protecting vehicle and load under full load conditions. But let's not forget that the vehicle may be driven faster when empty and that the shaking the vehicle may then get may also need protection.

In fact, the use of electronic equipment, for testing stresses in tank trucks and their suspension systems, revealed that the greatest unit stresses occurred

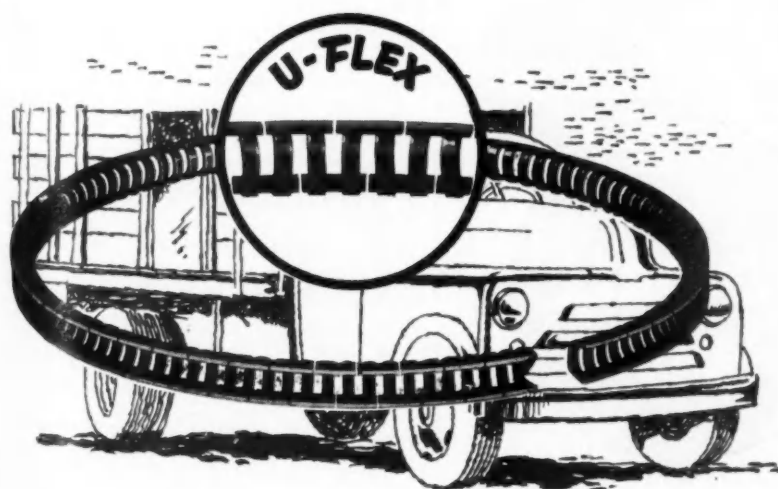
(TURN TO PAGE 104, PLEASE)



A PISTON RING to satisfy any oil control problem . . . that's Thompson's U-FLEX OIL CONTROL PISTON RING — used as original equipment by many car and truck manufacturers. Look at it closely. You'll find:

1. SIMPLE DESIGN that permits mass production yet gives premium performance at cost of ordinary rings.
2. EXTREME FLEXIBILITY permits conformity to cylinder walls—round, out-of-round, tapered or worn.
3. ONE-PIECE CONSTRUCTION assures low assembly cost. No shims or expanders required. Oil drain holes are never covered.
4. WIDE OPEN CHANNEL with no obstructions where carbon builds assures maximum oil drainage, long life without clogging.

## For engine performance you can take for granted: *count on* Thompson



5. LIGHT WEIGHT allows U-FLEX to follow tapered or out-of-round bores closely at high speed.
6. MULTIPLE GAPS distribute oil uniformly around cylinder wall reducing scuffing in upper ring area.
7. ANY DEGREE OF UNIT WALL PRESSURE, to meet the oil control problem at hand, is possible with U-FLEX spring-type construction.
8. RING GROOVE DEPTH variations do not affect U-FLEX wall pressure.

The Thompson engine test laboratories and staff of well-trained engineers are available to engine builders in solving internal combustion engine problems. Call us on any oil control problem.

### Thompson Products, Inc.

**SPECIAL PRODUCTS  
DIVISION**

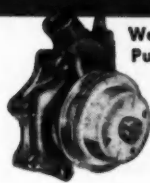
2196 Clarkwood Rd. • Cleveland 3, Ohio



Cylinder Sleeve



Industrial Pump



Water Pump



Piston Pin



Valve Seat Insert



U-Flex Piston Ring

COMMERCIAL CAR JOURNAL, July, 1952



## Leaf Springs

Continued from Page 102

in some important parts—when traveling at 40 miles an hour—when the tank was empty. Under those conditions, wheels bounced off the ground and there was also more vibration in the empty tank.

Many truck users cannot tolerate too much variation, between truck body floor levels, when empty or fully loaded, because of the fixed heights of loading

platforms. Consequently, truck spring deflections are often limited. This makes it difficult to achieve the utmost in riding comfort.

An operator of a large fleet of trucks and buses reports that when checking spring suspensions, he likes to secure about one-third of the normal full load deflection, with the chassis carrying only the empty truck or bus body. For instance, if the springs have an arch of 6 in. of usable deflection range, he likes 2 in. deflection for carrying the empty body and 4 in. available for carrying the full load. More deflection

range for carrying the empty body would be desirable, but one-third is all that is usually available when such variable loads are carried.

### Consider Riding Comfort

**I**N bus operations, the vehicle may be very lightly loaded, especially in feeder bus operations, for nearly 50 per cent of the mileage. Even though truck operators try to get return loads whenever possible, their trucks are also apt to be operated (except for loop operations of department stores) for as much as 30 to 40 per cent of their mileage lightly loaded or nearly empty.

No doubt the riding comfort of many earlier trucks could be greatly improved if the conventional springs originally used were replaced with springs of the progressive type as used as regular factory equipment on some late model trucks, Fig. 5. However, such progressive type springs usually weigh about 25 per cent more than conventional springs. Since springs are largely bought on a weight basis, this necessitates an increase in cost.

With these variable rate or progressive type springs, which have wide and successful use on passenger cars and buses, trucks could have a greatly improved ride under both empty and full load conditions.

With a sufficient number of thinner leaves—to give adequate interleaf friction—a properly designed leaf spring could be a perfect shock absorbing member—the only spring suspension that doesn't require auxiliary damping means to prevent rebounds. Yet considerations of cost and space usually limit the number of leaves. This also limits the interleaf friction, so better results in riding comfort may usually be secured by the assistance of those spring action dampeners which are generally, but incorrectly, called shock absorbers.

(TURN TO PAGE 106, PLEASE)



"WHAT DO YOU MEAN 'BUND'? I HIT YOU, DIDN'T I?"



**KENDALL, THE 2000 MILE OIL**  
...a Heavy Duty type engine oil fortified with selected additives to prevent bearing corrosion and the formation of excessive engine deposits.





**KENDALL F-L OIL (SHD)**  
...a superior Heavy Duty Diesel engine oil, detergent-dispersant recommended for units operating under severe service conditions. Surpasses the most exacting heavy duty specifications and requirements as set up by both industry and government.



**KENDALL SUPER D**  
...especially compounded for use in high output, super-charged Diesel engines, or engines operating on fuels having a high sulphur content. SUPERIOR LUBRICANTS (SERIES 2) Caterpillar approved.

KENDALL REFINING COMPANY — BRADFORD, PENNA.

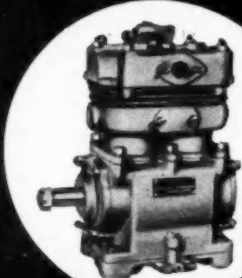
**Bendix  
Westinghouse**

THE WORLD'S MOST TRIED  
AND TRUSTED

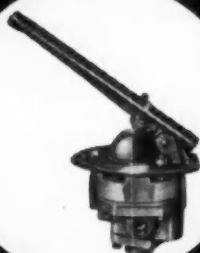
**AIR BRAKES**

## Feature for Feature.....

**the Finest Complete  
Braking System  
money can build or buy!**



The Bendix-Westinghouse Compressor—heart of the air brake system—performance proven over more miles on more installations than any other compressor available!



The Bendix-Westinghouse Brake Valve—main control of the system—unsurpassed for fine graduation and perfect control under all braking situations on any size vehicle.



The Bendix-Westinghouse Governor—hard-working watchman of the system—provides unexcelled assurance of adequate air pressure at all times to meet every braking need.



If you want a full 100% return on every dollar you invest in braking, it will pay you many times over to install Bendix-Westinghouse, the world's most tried and trusted air brakes. Why? Because only a complete braking system can give you the kind of performance that means highest operating efficiency at lowest operating cost. And with Bendix-Westinghouse you get the finest complete braking system money can build or buy! That's because each and every component part in the Bendix-Westinghouse system is designed to perform a specific function and to perform it better than any other make or model. For example, the rugged Bendix-Westinghouse compressor is noted for its long, reliable, trouble-free service; the brake valve for its greater capacity, finer graduation, faster application and release; the governor, for its extra dependability and ease of maintenance due to its mounting position away from high engine temperatures and excessive vibration. Put them all together with rugged Bendix-Westinghouse brake chambers and slack adjusters and they truly add up to tops in stops. But why not find out for yourself—stop in and see your Bendix-Westinghouse distributor today!

BENDIX-WESTINGHOUSE AUTOMOTIVE AIR BRAKE COMPANY  
ELYRIA, OHIO                      BERKELEY, CALIFORNIA

## Leaf Springs

Continued from Page 104

The maintenance of shock absorbers may be considered a bother. But especially on the front springs, they will do much to improve riding comfort as well as increase the life of the springs, if properly maintained.

The improvement of riding qualities may be approached from two angles—the psychological and the physical.

Many of us have ridden in buses in which a rattling fare box or loose window gave us the impression that the old "rattler" was also shaking us to pieces—even though the actual ride of the bus may have been up to usual standards. Time spent in tightening truck cab doors and windows may give the driver the impression of a better ride.

One spring manufacturer states that there is not much that can be done to improve riding qualities of present springs other than to take the leaves

apart, wire brush them and give them a good application of graphite grease. Molybdenum disulphide can be used in place of graphite grease as it stays on longer. One pound of molybdenum powder is mixed with 1 gal (approximately 8 lb) of amber petrolatum. The petrolatum is melted, stirred in with the molybdenum powder and allowed to solidify at room temperature. This makes a soft grease, easily brushed on springs with a paint brush. The mixture is not patented; anyone can make it.

We are advised that to improve riding qualities, an occasional oil lubrication especially at the leaf ends will help greatly. The oil won't last long, but using it at reasonable intervals will retard that horrible corrosion and "digging in" at the bearing ends of the leaves which ruins the riding responsiveness of old springs. To be sure, oiled springs may be temporarily too lively. Spreading the leaves, and inserting graphite at the leaf tips is even better. The leaf ends are the only spots requiring such lubrication.

A chief engineer suggests the use of a penetrating oil as a carrier for a metallic lubricant, such as lead or molybdenum disulphide proves beneficial. The metallic lubricants will give a better control of riding qualities than most greases, as a considerable amount of interleaf friction is desirable in truck springs. The big idea is to prevent rust on the contacting surfaces of the leaves.

### How Can Spring Life Be Increased?

**A**UTHORITIES agree that two steps are required to increase the life of springs. One is to prevent rust. That means keeping the springs well-greased between the spring leaves and also greased or painted on the outside. The second item is to keep the U-bolt nuts tight. There is a lot of leverage, between the spring clips and

(TURN TO PAGE 108, PLEASE)

### Navy Uses "Convertibles" Too

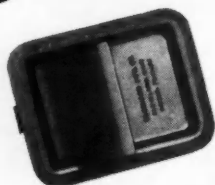


Twin Coach "Convertibles," multi-purpose vehicles, originally designed by L. J. Fageol for U. S. Army use, are now being employed by the Navy. "Convertibles," readily converted from buses to cargo trucks, are also equipped as high capacity litter carriers for field ambulance service.

## PADDLE HANDLE RECESSED DOOR LOCKS



Three-quarter view of No. 4879 (non-key locking) Lock showing single point locking slide bolt.



No. 4879. Full view showing handle raised and slide bolt retracted.



No. 4881. Key Locking Type. Same as No. 4879 but with wider receptacle. Available in pairs. Right hand shown.

## New Additions TO THE

## Popular **E** 'RECESSO' Line

Modern styled additions in 2 types of slam action locks with SINGLE POINT ENGAGEMENT. Paddle type handle is easily operated by lifting with hand. Pleasing in appearance. Easy to install on right or left hand, wood or metal doors. Cut hole close to edge of door and attach with screws, bolts or spot welding.

Write for literature.



7 "JOB PROVED" Items in the RECESSO line

# EBERHARD *Long Run* TRUCK BODY FITTINGS



EBERHARD MANUFACTURING CO.  
Division of the Eastern Malleable Iron Co.

EVARTS AVENUE

CLEVELAND, OHIO



# You can service Jeeps, Passenger Cars, and TRUCKS

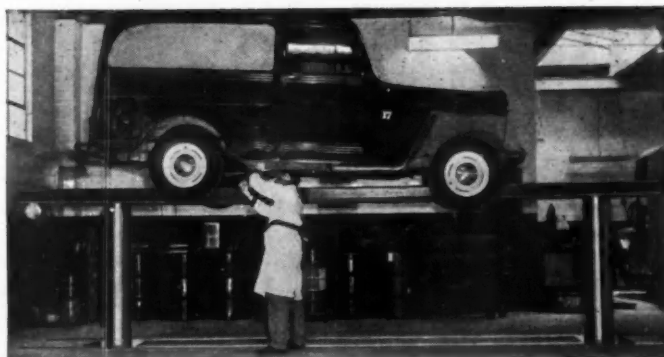
on this versatile

## Globe Hoist!

The photos tell the story. Three basic types of vehicles . . . wheelbases ranging from jeep to heavy truck . . . all handled by the same hoist! Now you see why so many fleet operators call the Globe CR Hoist the all-purpose, all-vehicle hoist.

This versatile Globe Hoist helps you get your vehicles out of the shop and back on the road *fast*. Frame, wheel, and motor jobs not only are done quicker but done *better*. This adds up to substantial savings in the time, labor, and expense involved in routine servicing, inspection, and repairs.

You can cut your maintenance costs with a versatile Globe CR Hoist. Use the coupon to get valuable data. Remember! Globe can supply a Hoist to meet any fleet operator's every need: Automobile and Truck Hoists, Loading Lifts, Elevators, Ramp Eliminators, Dock Leveling Ramps, etc.



# GLOBE

THE BEST LIFT

Globe Hoist Company, 1000 E. Mermaid Lane, Phila. 18, Pa.  
Factories at Des Moines, Iowa and Phila. Pa.

Globe Hoist Company  
1000 E. Mermaid Lane  
Philadelphia 18, Pa.

CCJ 432

Please send me complete information on Globe Truck Hoists.

Name.....

Address.....

City.....Zone.....State.....

I would like a copy of *Modern Lifting* ☐



### PMTA Accident Prevention Conference

The 19th Annual Meeting of the Pennsylvania Motor Truck Assn. was held in Harrisburg, June 6 and 7. The Accident Prevention Conference featured a panel discussion on the subject, "How an Accident Prevention Program Can Reduce Accidents." Moderator of the session was Harold Shertz (speaking). W. Robert Smith, of Ward Trucking Corp. (left) covered one phase of the subject. Wm. F. Crosssett, of Wm. F. Crosssett, Inc., took part in the panel; Isaac Roach, of Hutchinson-Rivinus & Co., and K. R. Sechrist, of Coastal Tank Lines also contributed to the discussion.

## THE BIEDERMAN TRUCK



*An All-Star Truck  
Constructed of All-Star Units  
Doing an All-Star Job Since 1920*

**DEALERS:** Compare the Biederman National Standard Model with any truck on the market and you will agree that it is an All-Star team in itself.

Only the most sturdily constructed units of America's leading manufacturers are built into it.

Biederman Trucks win by performance. Inquiries regarding dealership solicited.

WRITE, WIRE or PHONE

**BIEDERMAN MOTORS CORPORATION**  
CINCINNATI 14, OHIO

### "Heavy-up" Springs

Continued from Page 106

outer ends of the leaves. It is good practice to have all truck spring U-bolt nuts tightened once a week.

U-bolts should be kept tight to avoid breakage of springs at the center bolt hole. Spring eyes should be lubricated frequently, or the bushings will soon wear through.

Don't grease the leaves on the older trucks on which the springs have not been lubricated and so have been allowed to rust. If a vehicle has been running for some time with rusty springs and the springs are dismantled, carefully greased and replaced—they will probably break very quickly. This simply means that corrosion fatigue has already occurred. The application of grease has temporarily removed the damping effect of the rust between the contacting surfaces of the leaves—thus decreasing their shock absorbing action. This permits the leaves to deflect further, and the greater deflection results in greater stresses.

One large fleet operator, using trucks for strip mining and other heavy-duty work keeps his fleet records by "truck hours" in service, rather than by mileage. He figures that even though the trucks may travel only a few miles within an hour, their springs have been subjected to as severe punishment (as the truck weaves in and out of pits) as other trucks would receive while traveling 40 miles within an hour over smooth highways.

Alert fleet operators consider maintenance costs of springs a minor factor—as compared with the effect of the springs on the maintenance costs of the vehicle, the costs of goods damage and the comfort of the driver.

END

Please Resume Reading Page 70

COMMERCIAL CAR JOURNAL, July, 1952

# BRAKE MATERIAL

*Ever Made!*



In our road testing of 18 of the most popular brands of American made brake linings we discovered things that would never have been learned by the brake lining makers who depend solely upon the laboratory dynamometer for their performance data. We, too, use the dynamometer to obtain certain information, but actual road testing on Western Mountain Grades showed that the majority of brake linings would make only from 4 to 9 hard dead stops, all from 40 mph on a 13% grade, before they failed. We discovered and isolated the causes of those brake failures—ORIGINAL or hot fade—SECONDARY or cold fade. With that first hand knowledge, we did something about it. We developed LASCO SUPERBLOX which, under identical road tests scored 34 hard dead stops, all from 40 mph on a 13% mountain grade on a 2 mile stretch in a total elapsed time of 5 minutes. That's four times the best performance we found in any other brake lining, and on that score we offer LASCO SUPER BLOX as America's Finest Brake Lining.



In addition to SUPER BLOX, Lasco also produces BLUE LABEL ENGINEERED SETS which have an equal for self equalization, silent performance, and non-fade qualities. Also available are Lasco molded and woven brake linings in rolls, as well as molded segments and blocks for trucks, trailers and buses.

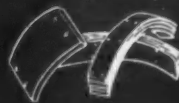


## LASCO BRAKE PRODUCTS CORP., LTD.

EASTERN HEADQUARTERS • 2181 LOCUST STREET • ST. LOUIS, MISSOURI  
SOUTHERN HEADQUARTERS • 300 MADISON AVE. • MEMPHIS, TENNESSEE  
WESTERN HEADQUARTERS • 2678 MAGNOLIA ST. • OAKLAND, CALIFORNIA  
KANSAS CITY, 1420 MOORE STREET • FORT WORTH, 910 FLORENCE STREET

Los Angeles San Francisco Sacramento  
Portland Seattle Spokane Salt Lake City

## LAHER INDUSTRIES



LAHER TIRE & RUBBER CO., INC. • LAHER BATTERY PRODUCTION CORP. • LAHER SPRING & TIRE CO. • LASCO BRAKE PRODUCTS CORP., LTD.



# Trailership Service Begins Between Albany and New York

A trailership service, utilizing converted LST's, has made its debut in round-trip service between New York and Albany. A carrier may now drive his trailer dockside at one of the terminals, and arrange its delivery in the

other. Trailers are handled by the shipping company, and the time between Albany and New York is based on a 10-hour schedule.

At present, American and Overseas Chartering Corp. operate the service,

with Trailer Terminal Inc. operating the Albany end of the arrangement. Officials of the operating companies have expressed the belief that the service would expand, directly as the demand increased. The new plan is designed to concentrate on low-rate bulk freight that ordinarily could not be moved by truck because of overhead involved.

A formal opening of the service was held in May, with Edward F. Cavanaugh, Jr., commissioner of marine and aviation, cutting a ribbon stretched across the Trailership Albany, signaling that the first trailer was to be loaded.

The Motorships Albany and New York were converted from World War II Landing Ships Tank. Each is 327 ft long, 50 ft wide and has a —10 ft draft. Fifty trailers can be accommodated on the two decks that are reached by specially constructed ramps. The charge will be \$50 for any trailer up to 32 ft.

The truck trailers can be unloaded in about an hour with "horse" tractors. The service is designed so that trucking companies deliver their trailers to the terminal, unhitch the tractors for use on some other job. The trailer is loaded and unloaded aboard the ship by the shipping company.

There is space for 500 trailers in the yards at Albany and about 4000 sq ft of parking space at West 29th St. in New York.

Each ship is powered by two 1200 hp GMC diesels on twin screws reaching a cruising speed of 11 knots. This brings the trailership travel time to 10 hours each way.



## ARE DRIVERS "RAILROADING" YOUR VEHICLES?

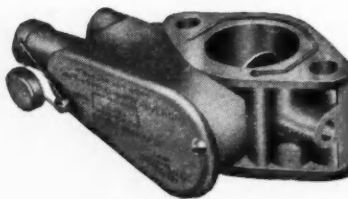
### Handy Governors Will Stop It

Any driver is likely to be less than meticulous in his care of a vehicle he doesn't own. Many feel no compunction about "railroading" your vehicles. Drivers do most of their work away from supervision . . . abuses are hard to correct.

Handy Governor will stop "railroading"—stop practices which run up costs and wear out vehicles before their time.

The savings in tire, fuel, and lubricant costs, engine repairs, brake maintenance and general maintenance are spectacular. Reduced accident and insurance costs are equally important.

Let us show you some figures on savings — and tell you how little it costs to get them.



## KING-SEELEY CORPORATION

ANN ARBOR, MICHIGAN

PLANTS AT  
ANN ARBOR, SCIO,  
YPSILANTI

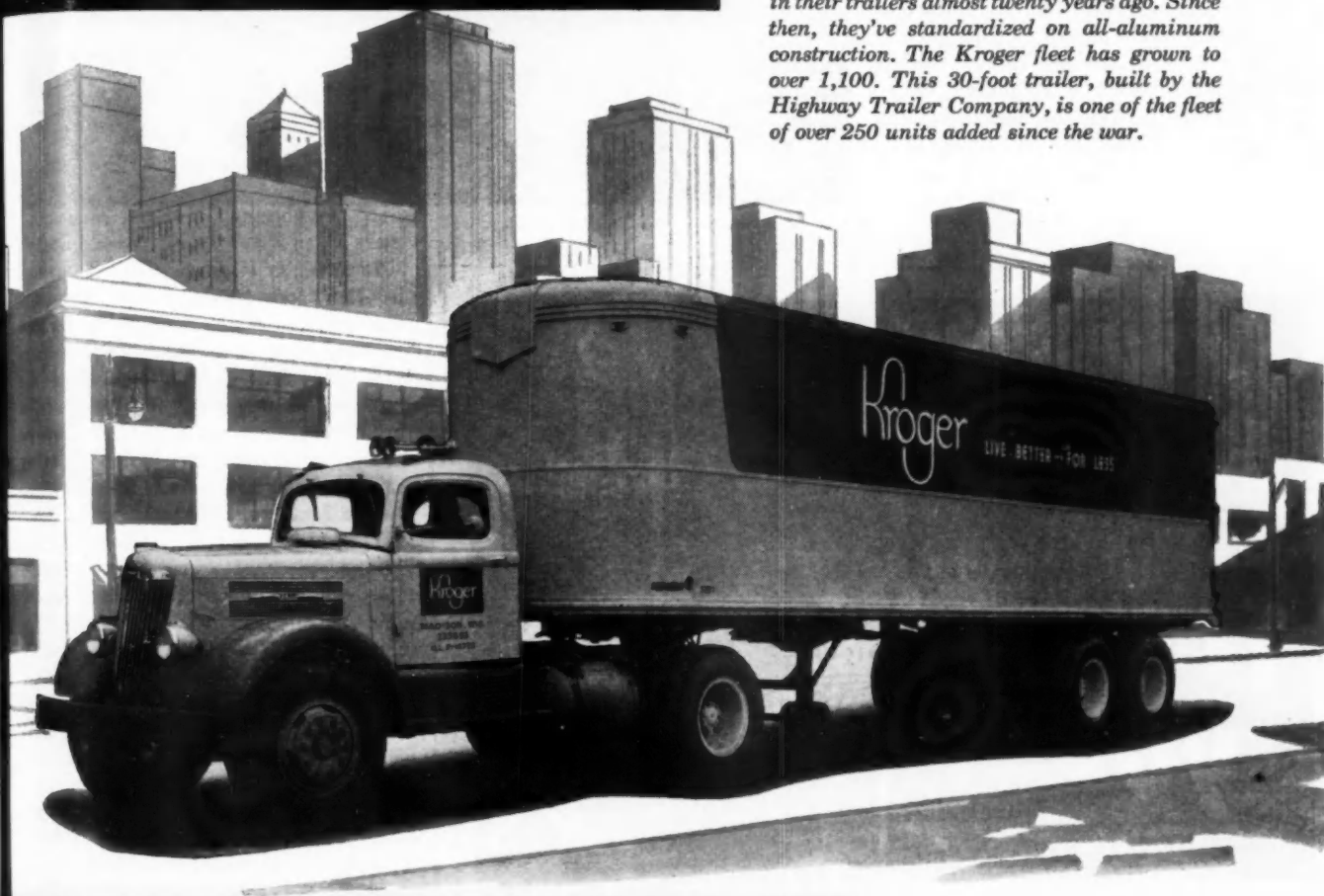
### New Axle Spread



Because of the "bridge formula" upon which the laws of many states are built, there is an advantage to the trucker in having a greater axle spread, according to a report from Fruehauf Trailer Co. No basic changes are required in the gravity-tandem suspension with the exception of dimensional differences due to the increased axle spread. This Fruehauf trailer has a tandem trailer available with this wide axle arrangement.

# or across town

The Kroger Co. first used Alcoa Aluminum in their trailers almost twenty years ago. Since then, they've standardized on all-aluminum construction. The Kroger fleet has grown to over 1,100. This 30-foot trailer, built by the Highway Trailer Company, is one of the fleet of over 250 units added since the war.



# PAYS OFF!



# ALCOA

*First in Aluminum*  
**THE METAL THAT LASTS**

These are the "dollars-and-sense" reasons why it will pay you to equip your fleet with premium trucks and trailers constructed of Alcoa Aluminum. Alcoa's 36-page booklet "Payload Proof" will help you plan for more profitable equipment. Write today:

ALUMINUM COMPANY OF AMERICA  
1876-Gulf Building • Pittsburgh 19, Pennsylvania



NOW 6:30 P. M. EDST every Sunday—"SEE IT NOW" with Edward R. Murrow . . . brings the world to your armchair . . . CBS Television

COMMERCIAL CAR JOURNAL, July, 1952

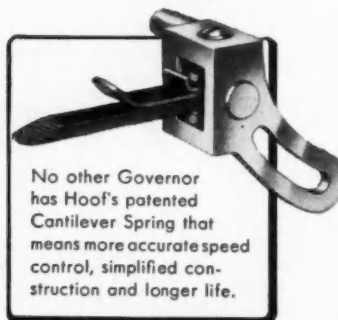
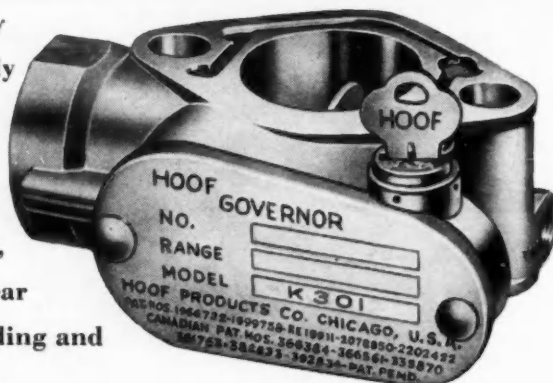
# Truck Stop Built in Swamp

THE largest truck stop between Minneapolis and Chicago is built on a five acre tract of filled-in swamp land at Evansville, Wis., a community of 2500 population. The building is large enough for all over-the-road units to drive inside, including carrier rigs and other high jobs.



**YOU DON'T PAY FOR  
HOOF Governors  
THEY PAY  
YOU!**

Hoof Governors pay back their extremely low cost many times each year... actually save from 20% to 50% on tires, brakes, clutches, rear ends, motor rebuilding and other maintenance expense... save on gas and oil, reduce accident hazards. Against savings such as these, the few dollars invested per Hoof unit are truly negligible. Write for FACTS!



**HOOF PRODUCTS CO.**

6543 So. Laramie Ave.,  
Chicago 38, Ill.

Located on Highway 14, it is owned by Ben and James Green, Evanston feed and grain merchants and operated under concession arrangements. The station was built a year ago, and the building measures 40 ft by 140 ft, a brick and steel structure. Its proven popularity is evidenced when as many as 50 trucks are parked at one time on the black-topped station grounds.

The filling station, restaurant and garage are concessioned by the owners and each section is operated as an independent enterprise. The garage concessionaire, William Jeske, states that the truckers like the big 14 ft sliding doors since they make it possible to drive inside the garage building without unhitching a trailer, or with plenty of sky room for a straight job.

While Mr. Jeske offers truck maintenance and repairs to the unit, there are upstairs bunks, shower facilities and a reading room with a desk—all for free.

Because of the volume of business, there is no body work offered at the garage, but wheel bearing, brake, axle and tire troubles are cared for by a staff of truck mechanics. Mr. Jeske claims that the garage is the only one between Chicago and Minneapolis where trucks of all sizes can drive inside.

Its setup for inside work has come to the attention of some of the larger trucking companies, including Sears Roebuck and Gateway. A number of spare tires for the units belonging to these fleets are left at Motorport to be picked up in case of a road call.



The Motorport building is of steel with a concrete face and an in-line service lane which offers fleet operators an inside, maintenance set up



# Better Work Doubles Drum Life

Continued from Page 63

matching them when necessary for best operation. We now test and match valve springs. We also test our diaphragm springs to see that they have the proper qualifications for their job.

In testing brake springs on many vehicles we discovered that springs which had been in service for any considerable length of time were hardly ever alike and so we developed a system of retaining all springs that came within useable limits and matching them up in sets.

We installed a brake drum lathe and a contour grinding machine for grinding brake lining to the drum contour.

## Better Grinding Pays Off

WE HAD been sending our brake drums out for turning and were being continually unimpressed by the quality of the work and distressed by the amount of metal being removed from the drums which materially shortened their life. It was particularly unpleasant to have drums returned showing tool marks where the operator had started his cut too deep and had backed out and started it over in a shallower cut. Turned drums came back rough as files and this shortened our lining life.

This is not to criticize all retail brake establishments for bad work but rather to point out that work acceptable to the general public is not generally acceptable on heavy-duty buses. The retail operator has a flat rate time problem and often cannot take an extra cut or make a grind to get a smooth drum within the flat rate price without loss.

## South Goes LP



What may well be the first mass delivery of International liquefied-petroleum-gas-powered trucks in the south finds E. M. Ford (left), Birmingham, Ala., district sales manager for International Harvester Co., turning over ten LP-195's to C. D. Deaton of the B. & M. Express Co., Inc. The delivery was the first on an order for 30 units placed by B & M which operates between Birmingham and Memphis, Tenn.

Having returned this work to our own shop and direct supervision we instituted a program of removing just as little metal as we can to smooth drums and we've increased drum life 50 to 100 per cent.

When brakes are fully in contact with the drum, brakes are more effi-

cient. They retard the vehicle with less pedal pressure and stops are quiet and smooth.

With a view toward making each drum last longer by removing the least amount of metal and at the same time know what we are doing, we stamp the rim of each drum with the measurement.

To eliminate the necessity for cutting large amounts of metal from our drums we see that they are never scored by the rivet heads in worn linings. Worn linings are removed before damage can (TURN TO NEXT PAGE, PLEASE)



Route your trucks the shortest way every trip. The time and gas used by your drivers looking for unknown streets, driving all around Robinson's barn to make deliveries, will buy a hundred maps like Hearne's Street Map of your city and county area.

Street names are in big, black type, and instantly spotted with Hearne's patented, automatic Street Finder. And every map is mechanically indexed.

Over 100,000 truck owners use Hearne maps every day to give customers better service and cut truck mileage. Many users claim they save the cost of the map in a single day's use.

## YOUR CITY MAP FOR 10-DAY FREE TRIAL

Send for cloth, cellophane-finished 44" x 65" map now. Stop delivery waste. Mark routes in crayon we supply. Washes off instantly. Use map for 10 days. Then, if you can get along without it, send it back... or send \$42.50 and it's yours.

## MAIL TODAY OR USE YOUR LETTERHEAD

### FREE EXAMINATION ORDER FORM

Hearne Brothers (America's Largest Manufacturers of Commercial and School Maps)

23rd Floor, National Bank Bldg., Detroit 26, Michigan.

Without obligation on my part, send me a map of my city and county area. After 10 days' FREE use in my office I'll return the map or remit \$42.50. Prices on cloth, cellophane, spring rollers, stainless steel and labor are going up! Order today!

Your Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

Zone \_\_\_\_\_

State \_\_\_\_\_

## Better Brake Work

Continued from Page 119

be done to drums. Under such conditions of operation it is surprising how much mileage good brake lining can deliver since smooth drums also contribute to the longevity of the lining.

Another policy we have adopted in regard to our brake drums and which has contributed materially to its success is the insistence on smooth drums. While we do not remove much metal.

we insist on a perfectly smooth cut and usually finish with a grinder for an extra smooth finish.

We have been surprised to discover that drums on our new buses may not always come up to our own shop standards. We have found new drums that were out of round and others that were not turned down smooth. If we allowed such new drums to go into operation, we would, of course, have both shortened drum life as well as brake lining. Now we check all new drums and usually true them up before they are installed.

## Vehicles Are Safer

HERE are some of the savings we attribute to our detailed brake operation in addition to extra life for brake parts themselves: (a) less wear on engine mounts; (b) less wear on rear axles; (c) less vibration damage and fewer body cracks; (d) safer operation on ice and glaze. Our brakes always pass the annual Illinois state safety inspection 100 per cent.

Since we have the horizontal spring testing machine and have made good use of it with our brake springs, we also extended its service to check all springs, establishing standards for such tests when none were available from manufacturers.

This, of course, includes testing engine valve springs. Valve spring testing is, of course, more common than brake spring testing. We make sure that every overhauled engine has a matched set of valve springs which operate within the range specified by the manufacturer. Such a system reduces valve wear and particularly the burning of valves but it also does a great deal more for general engine performance. It makes engines idle more smoothly. Engines can be idled to factory specifications which insures proper water pump operation and cooling and maximum economy. Engines which idle rough and operate well enough under load at open throttle are a nuisance and an unnecessary threat to engine life. When idle screws have to be set up, economy goes down; operation is more jerky and such an engine does not give a driver confidence. One of the principal points is that smooth idle contributes to overall smooth operation which is so much appreciated by the passengers who pay to ride our buses.

The fleet of the Springfield Transportation Company, of which C. E. Davis, is vice-president and general manager, consists of 68 buses. We have 30 Fords which are being converted from V-8 engines to 6-cyl L-head; 5 Marmon-Harrington; 13 34-S-38-S Twin Coach; 10 27-G Twin Coach; 10 F-35 Southern.

END

Please Resume Reading Page 64

## High Class Stuff

Trucking Tycoon: "Lizzie, my wife tells me you are engaged and I wish to congratulate you. You are an excellent cook and I hope you will stay on after your marriage. When are your nuptials coming off?"

Lizzie: "On our wedding night, and not a day befo'."

COMMERCIAL CAR JOURNAL, July, 1952

### THE *Anthes* LINE



Shines Out!

FOR SAFETY

FOCO FLAR  
NOW AT LOWER PRICE

FOCO FLAR gives the highest in reflective protection. Brilliant Tri-lite lenses of DuPont Lucite with exclusive, accurate reflective angles. Cleverly folds into base for scratch-free storage. Approved. Single or in sets of 3 with bracket. Also available with flags and flexible staffs. Ask your jobber for Anthes Foco Flar.



LIGHTS



REFLECTORS



FLAGS FUSES



FOCO FLAR



FATHOMETER



FATHOMETER

ANTHES FORCE OILER CO.,

FORT MADISON, IOWA

# Anthes

THE FIRST LINE OF SAFETY

... and proud to serve the safest  
drivers on the road!





## *Don't send a boy to do a man's job!*

**C**AREFUL, SONNY! You're taking on a man-sized assignment when you set out to lift a motor.

Same way . . . you have to be careful about the motor oil you specify. Trucking is a tough business. Long hard runs! High temperatures! Heavy loads! Your fleet of heavy-duty trucks needs the protection of a tough "man-sized" motor oil.

Phillips 66 Heavy Duty Motor Oil is made from fine-quality crudes, specially selected, scientifically blended. These tough

crudes are then carefully processed by "cold fractionation", a refining technique which preserves the basic film strength and exceptional lubricating quality of the oil.

Specially tested additives in Phillips 66 Heavy Duty Motor Oil guard engines against acid action, disperse carbon and sludge, protect against corrosion. For the whole story on this "man-sized" oil, ask to have a Phillips lubrication engineer call on you. Write to Phillips Petroleum Company, Bartlesville, Oklahoma.

*Oil for the Engines of Commerce*



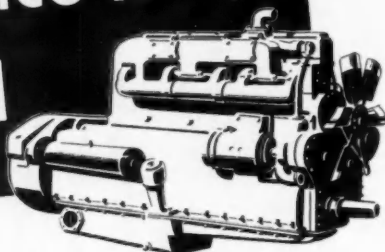
# **PHILLIPS 66 HEAVY DUTY MOTOR OIL**

COMMERCIAL CAR JOURNAL, July, 1952

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**When Engine  
Performance Is  
Doubly Vital**



## Select Engineered Oil Filters

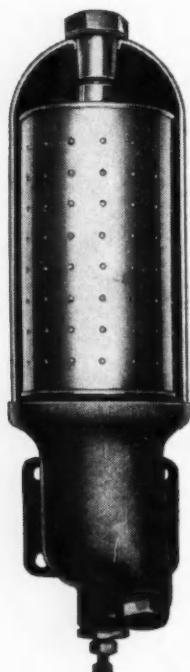
● No matter for what important purpose engines are used today — good oil filters are doubly important to —

- Save Oil
- Prolong engine life
- Prevent needless early parts repairs or replacements
- Save man-hours of scarce labor

**MICHIANA** Engineered Oil Filters have for many years proved that they accomplish the important savings mentioned above. Year by year they are used by more and more engine and engine-driven equipment makers—and the more exacting the task, the more the growing preference for **MICHIANA** Engineered Oil Filters is emphasized. Made for gasoline, diesel and gas engines of all capacities.

**MICHIANA PRODUCTS CORPORATION**  
Michigan City, Indiana

# MICHIANA OIL FILTERS



Cut-away view shows location of filter element in filter housing.



To insure maximum efficiency and protection, always use Michiana Replaceable Elements.

## Introducing . . .

... **W. J. Mergard**, in charge of the Detroit sales district, Prest-O-Lite Battery Co., Inc.

... **Paul G. Viall**, vice president of the Cleveland Cartage Co., Cleveland, Ohio; and a subsidiary, Toledo Cartage Co., Toledo, Ohio.



... **Lester F. Cox**, executive vice president and executive manager of the Thermoid Co., Trenton, N. J.



... **Wendell Pendleton**, as manager of the Kansas City, Mo., division, Van Norman Co., manufacturers of automotive service equipment in Springfield, Mass.



... **Ernest J. Klimczak**, appointed chief engineer, secretary of the company, and member of the board of directors, Ahlberg Bearing Co. Chicago, Ill.

... **George W. Brown**, as executive engineer Wagner Corp., St. Louis, Mo.



... **F. A. Keihn**, elected a vice president, Evans Products Co., Plymouth, Mich.

... **Preston M. Postlethwaite**, assistant branch manager of the New York Automotive Branch, Wagner Electric Corp., Jersey City, N. J.

miles per drum replacement

# **WORLD BESTOS RED BLOCK**

famous "J" combination brake blocks  
**REDUCE HEAT CHECKING**  
... no. 1 cause of brake drum failure

Continuous, high-pressure braking produces abnormal stresses in overheated brake drums, causing distortion and cracking known as "heat checking." Heat checking invariably means drum replacement ... a major expense in heavy-duty vehicle maintenance.

Many operators, like McFarland & Stample, have reduced this cost materially by installing World Bestos RED BLOCK on all fleet units! RED BLOCK performs efficiently at brake temperatures high as 1300 degrees ... is impervious to glaze or water film ... actually gives drums a smooth finish that provides a perfect braking surface at all times. As a result, RED BLOCK gives safe, dependable stopping power with considerably less brake pressure and less frequent application. Less severe braking gives the drums a chance to dissipate heat more rapidly ... reduces danger of checking ... greatly prolongs drum life.



## **Get these big RED BLOCK advantages for your fleet**

- GUARANTEED NO-FADE PERFORMANCE ... (Heat or Water)
- LONGER DRUM LIFE ... reduces replacement expense
- MORE MILEAGE ... between relines

See your Jobber



or write direct to: **WORLD BESTOS, New Castle, Indiana**

**WB WORLD BESTOS** NEW CASTLE INDIANA

## Conference Corner

Continued from Page 6

very large center bearing area to ultimately cover the entire shoe. The lining is worn-in from the center to the ends which contrasts to the previous approach where the wear pattern developed from the heavily loaded ends toward the center of the shoe. The question most frequently asked is, "How long does it last?" This reply is self-evident in that the shoe and

drum surface set their own pattern. The objective is to more nearly anticipate the ultimate pattern during the run-in period and thus prevent damage to the material. The very nature of brake operation makes it impractical to introduce a brake conditioning period similar to that necessary for engines. It is, therefore, necessary to evolve a process which will secure the

desired lining conditioning in the early stages of its use on the brakes. "Crown Grinding," which derives its name from the center contact of the shoe and drum, has been found practical in accomplishing this objective. An excessive amount of end clearance will result in an extended run-in period and in the case of operation with stiff brake drums, a loss of brake performance will be noticeable. A reduction in end clearance will give a corresponding change in these effects.

This shaping of the lining surface to a reduced curvature should not be confused with the former practice of chamfering the ends of the lining. The chamfering does not eliminate the sharp edges while the "Crown Grinding" insures a continuous surface and a uniform deflection pattern for the brake drums with no localized stress points. Drum service life is very definitely improved.

This same feature of end relieving can also be obtained by grinding the brake assembly to a nominal size and using drums which have been turned to an oversize. It is not necessary to grind away usable brake lining at the center of the brake shoe to obtain a reduced curvature. In the case of shoes having self-centering features or eccentric pin adjustments, the shoes can be removed and ground to the smaller radius as a shoe and lining assembly. This practice is quite usual on these types of brakes at the present time.

For heavy duty cam operated brakes, it is a simple matter to replace the cam head with a dummy spacer plug which will permit further release of the shoes so that the smaller grinding diameter will not cause the removal of material at the center of the shoe.

Any process used to accomplish the objective of securing end clearance for the lining need not be involved or expensive. The amount of end clearance necessary to anticipate the ultimate wear pattern of the lining will depend on the hardness of the lining, stiffness of the brake drum and the brake operating pressures. The fundamental to be recognized is that the brake drum is not round when the brake is applied. Under these circumstances, it is only a half measure to grind lining to the shape of a free drum. It is better to anticipate the ultimate pattern and not damage the lining and drum materials in the run-in stage. The idea has found wide usage with highly beneficial results in both original equipment and replacement fields.

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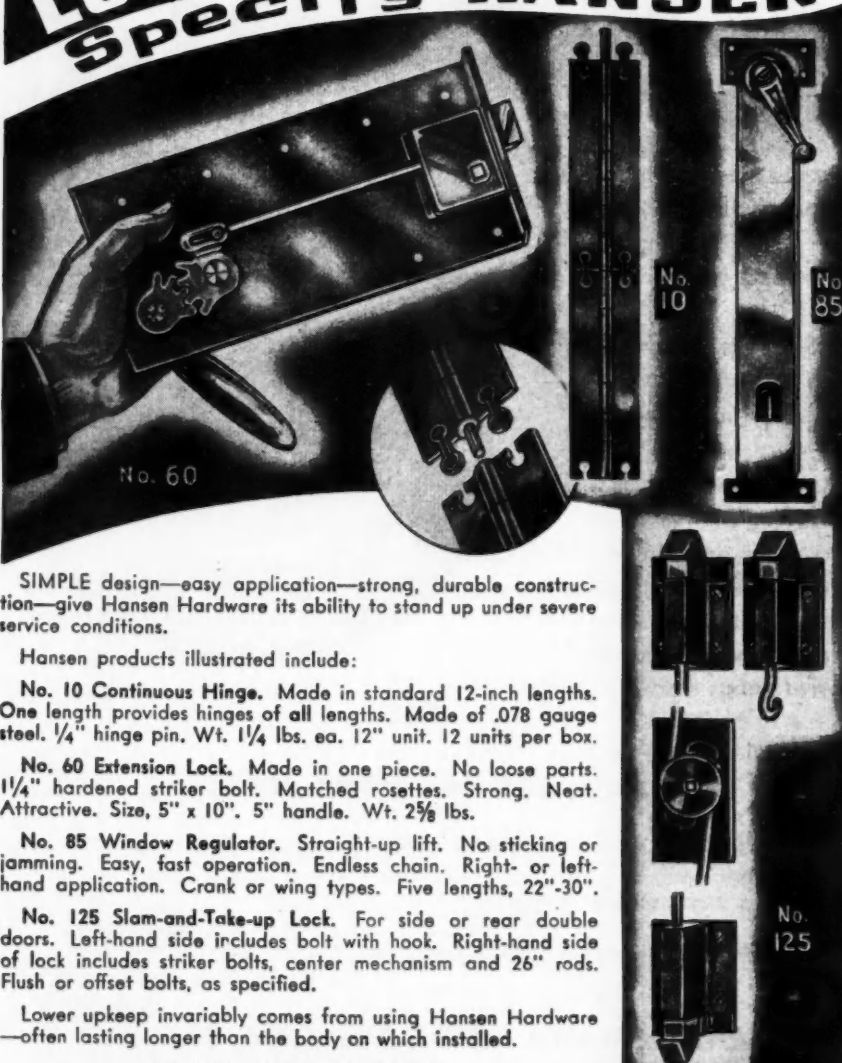
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COMMERCIAL CAR JOURNAL, July, 1952

*for*

# LOWER UPKEEP COSTS

*Specify* **HANSEN**



**SIMPLE design—easy application—strong, durable construction—give Hansen Hardware its ability to stand up under severe service conditions.**

Hansen products illustrated include:

**No. 10 Continuous Hinge.** Made in standard 12-inch lengths. One length provides hinges of all lengths. Made of .078 gauge steel. 1/4" hinge pin. Wt. 1 1/4 lbs. ea. 12" unit. 12 units per box.

**No. 60 Extension Lock.** Made in one piece. No loose parts. 1 1/4" hardened striker bolt. Matched rosettes. Strong. Neat. Attractive. Size, 5" x 10". 5" handle. Wt. 2 5/8 lbs.

**No. 85 Window Regulator.** Straight-up lift. No sticking or jamming. Easy, fast operation. Endless chain. Right- or left-hand application. Crank or wing types. Five lengths, 22"-30".


**No. 125 Slam-and-Take-up Lock.** For side or rear double doors. Left-hand side includes bolt with hook. Right-hand side of lock includes striker bolts, center mechanism and 26" rods. Flush or offset bolts, as specified.

Lower upkeep invariably comes from using Hansen Hardware—often lasting longer than the body on which installed.

**REQUEST CATALOG GIVING COMPLETE INFORMATION**

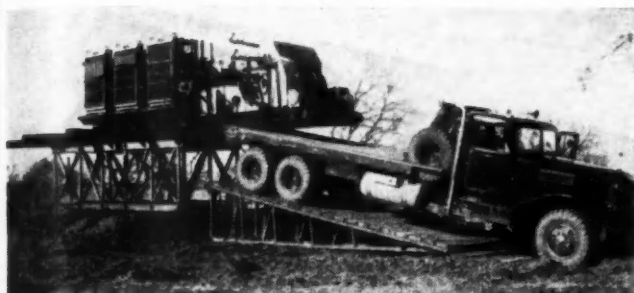
## A. L. HANSEN MFG. CO.

5047 RAVENSWOOD AVE., CHICAGO 40, ILL.





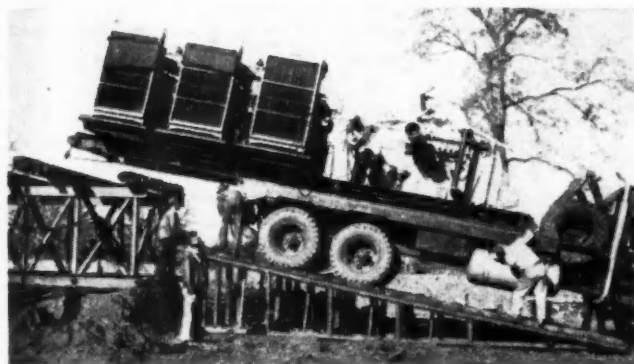
# EASY DOES IT! ANOTHER WAY BRADEN SAVES MANPOWER...



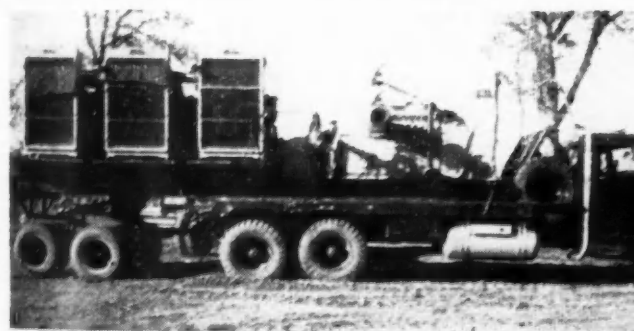
An oil well drawworks and power unit is ready to move.

Ramp is placed in position and truck is backed up.

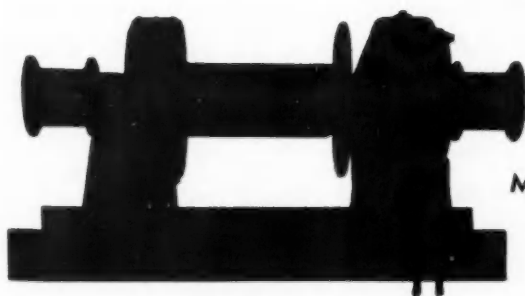
Line from BRADEN Winch MS50-20B is hooked on drawworks and power unit.



The powerful winch has pulled this unit, which weighs between 65,000 to 100,000 lbs., onto body of truck. Two men can do all the work in record time.



Drawworks and Power Unit loaded, and ready to go. When it arrives at new location this BRADEN-equipped truck can slide unit off and on to the substructure.



MODEL MS50-20B

Here's the winch that did the job. It has a capacity of 100,000 lbs., and is equipped with the BRADEN OIL-COOLED, FULLY ADJUSTABLE, AUTOMATIC SAFETY BRAKE.

**BRADEN WINCH COMPANY**

P. O. Box 547, Broken Arrow, Oklahoma



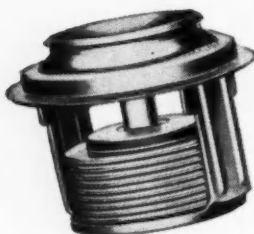
# Small Fleet Cuts Accidents

Continued from Page 70

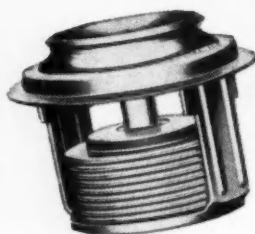
We have found the videograph such a good flexible educational medium that we use it in sales and production talks as well as in our accident control program.

We use the videograph in our general talks on leading typical hazards like backing, intersections, etc. We find it more flexible than slides or films.

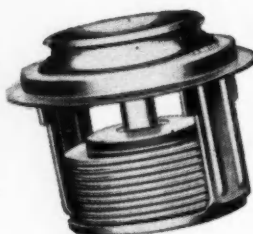
At these monthly meetings we point out to the men what an accident costs in terms of our product. For example, a \$25 accident costs us a 2-days' route of Pepsi-Cola volume before we realize \$25 net profit. In other words, our truck has to be on the streets for two days to earn the \$25 that will pay for damages caused by the accident.



No. 19 (160°)



No. 319 (170°)



No. 119 (180°)

## 3 temperature settings for '51-'52 Fords!

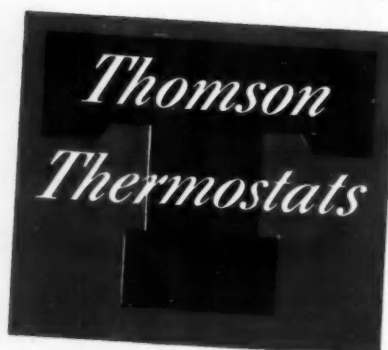
For proper fit and top performance, 1951-52 Fords require a special thermostat, different from any previous stat. And for service on these popular cars and trucks, *only Thomson* offers you a stat in *three* temperature settings . . . No. 19 for summer use, No. 319 for use with alcohol, No. 119 for use with permanent anti-freeze. For Fords—for cars

and trucks of all makes, models and sizes—the thermostat name to remember is **THOMSON**—the most complete line of quality stats available . . . anywhere!

STANDARD-THOMSON CORPORATION  
DAYTON 2, OHIO



Used as original equipment by major car manufacturers



When an accident happens, I go over the accident with the service salesman to learn all details. It is not our purpose to penalize him. I try to put him at his ease, impress him that with his cooperation we can make him a safe driver. The committee takes up from there, retests him and retrains him before putting him back on his route. He signs a pledge that he will abide by instruction and adopt these safe practices. Thus, we try to remake them—not replace them.

Our supervisor turns in for each driver a report on driving practices covering 25 items every 60 days.

No driver is aware when he is being tested for the same supervisor accompanies salesmen on their daily routes on sales and promotion checkups.

We require each driver to turn in a weekly report of the condition of his vehicle. The shop takes up this report, pulls the vehicle's service record and makes the needed repairs and adjustments. This is in addition to the preventive maintenance inspection given each truck periodically.

We keep an accident record on each service salesman. A Safe Driver's Score Sheet is prominently displayed on the bulletin board with monthly recordings on each salesman. On the score sheet we list each driver and post upon the completion of 30 days, No. 1, designating he has had a full month of driving with no accidents; No. 2, if he has completed two months of driving without accidents, No. 3, if he has had no accidents in 3 months, etc. If he has had an avoidable accident, an X is placed against his name for that month, and the score keeping for a perfect record starts all over again.

Publicizing the record on the bulletin board for all to see has a marked effect upon the men. Drivers are proud

(TURN TO PAGE 130, PLEASE)



"We prefer this custom-built job for its accessibility!"

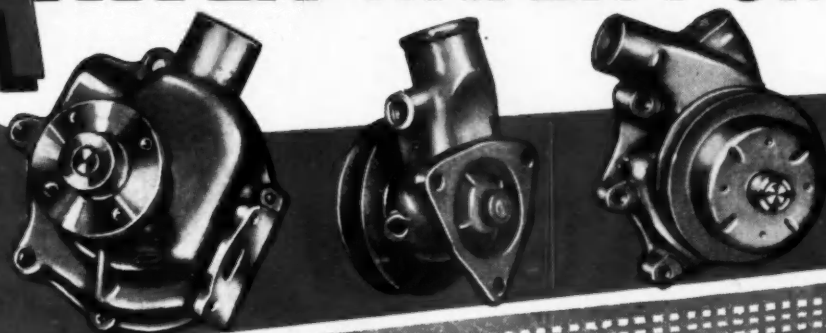
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job for  
uly, 1952

*Announcing*

AN IMPORTANT ADDITION TO THE AIRTEX FAMILY!

A Complete Line of NEW

# AIRTEX WATER PUMPS



In response to widespread customer demand, we proudly present this latest addition to the AIRTEX family. The same high quality and integrity that have earned the respected position for AIRTEX Fuel Pumps and AIRTEX Anti-Pulsation Fuel Filters will be maintained in this complete line of new AIRTEX Water Pumps.

## THESE SUPERIOR AIRTEX FEATURES GUARANTEE CUSTOMER SATISFACTION

- DUPLICATE car manufacturers' original equipment
- VACUUM-TESTED to assure perfect pumping action
- BEARING AND BUSHING types for proper application
- LEAKPROOF SEALS provide complete protection
- COMPLETE COVERAGE—for cars and trucks
- PACKAGED COMPLETE—ready for easy installation
- FULLY GUARANTEED FOR TROUBLE-FREE PERFORMANCE

IMMEDIATE DELIVERY! Contact your AIRTEX JOBBER or write today for catalogs and prices

# AIRTEX

## AUTOMOTIVE DIVISION

FAIRFIELD, ILLINOIS

The World's Largest Independent Manufacturer of Fuel Pumps

COMMERCIAL CAR JOURNAL, July, 1952



## Fleet Cuts Accidents

Continued on Page 128

of their perfect no-accident scores. Each driver is made conscious of his own ability to drive safely. A competitive spirit is stimulated as he compares himself with other staff members.

For management, the score sheet reveals at a glance who is in need of further instruction and training in safe driving. Also, it points out those building an outstanding no-accident

record. We award 3-month and 6-month certificates for safe driving at a special staff get-together every 6 months. We invite the wives of the men, have a buffet supper and call up each man individually to make his certificate presentation. Our five-man company band fills in the evening with square dance music. The men take great pride in receiving awards to the accompaniment of a handshake and applause. Bringing the wives in to help support our safe driving program, we believe, is a factor in the good results we have had.

Certificate awards are given for 18-month, 2-year, 3-year, 4-year no-accident records with a gold pin ahead for the driver who has had no accident in 5 years. The certificates are prepared by the insurance company after a preliminary correspondence with us on the month's accident record.

It is my own belief that a safe fleet is up to management. If management is willing to apply the findings and materials that safe driving groups like National Safety Council and insurance companies map out, accidents can be materially cut. A sizeable cut in insurance premiums will accompany the declining accident rate.

END

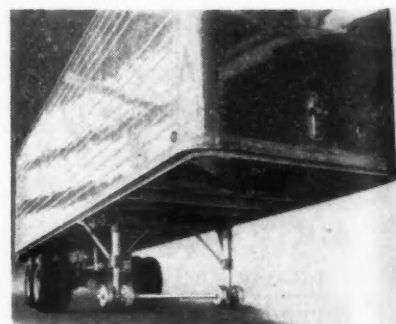
Please Resume Reading Page 71

## Fruehauf Van

Continued from Page 78

The floors are also of a completely new design of extruded aluminum, with options of any other type of floor in the wide range of choice Fruehauf has available to meet individual needs.

Beside giving outstanding appearance, the full length, smooth aluminum panels provide an ideal exterior surface for owner identification and decoration. The entire length and height of the van body are available for display painting of any nature desired by the owner.



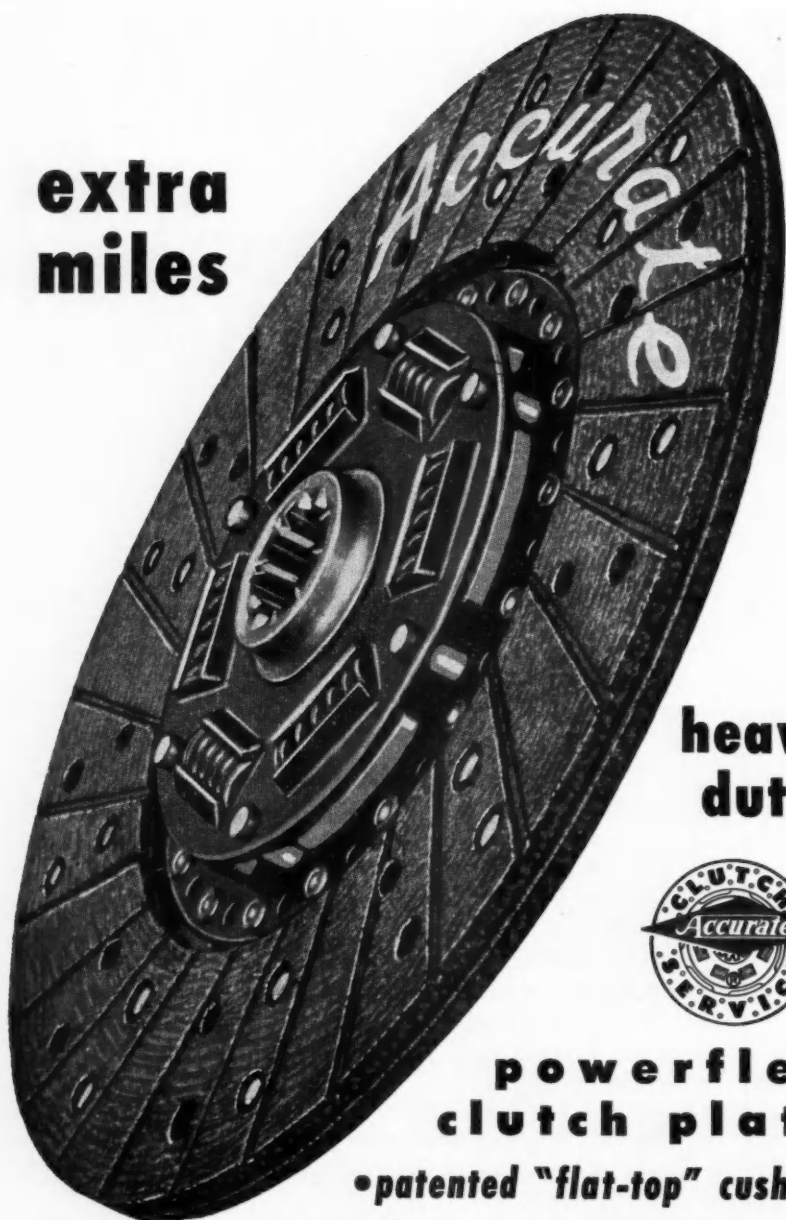
This new trailer is equipped with the Fruehauf foundation brakes with lightweight pressed steel brake shoes. The upper coupler plate is said to be ideal for wide angle coupling, when operating in confined loading space. Doors have welded steel frames. There is a choice of two spring suspensions—Fruehauf Multi-Rate with single axle and Fruehauf Gravity-Tandem for dual axle models.

End

Please Resume Your Reading  
On Page 80

COMMERCIAL CAR JOURNAL, July, 1952

**extra  
miles**



**heavy  
duty**



**powerflex  
clutch plate**

- patented "flat-top" cushion
- triple-duty spring supports
- exclusive self-aligning hub splines



**Accurate PARTS MFG. CO.** 12435 Euclid Avenue  
CLEVELAND 6, OHIO

# BATTERY MAINTENANCE TEAM SAVES YOU MONEY 3 WAYS!

1. Cuts Road Delays
2. Ups Battery Life
3. Prolongs Life Of  
All Electrical Units



This team—the simple, handy Goodyear All-Purpose Battery Tester, and the Fleet Battery Maintenance Card—is all you need to keep an accurate “fever chart” of each battery. Saves trouble, delays, money!

**T**HIS simple, easily followed plan will save you money—save you time—and cost you next to nothing to operate! And it guarantees you longer life from every battery in your fleet.

Simple? Easily carried out? All you need do is this: each time your maintenance man waters batteries, he makes a quick test with the Goodyear All-Purpose Battery Tester—marks his findings on the Fleet Battery Maintenance Card—a separate card for each battery. So long as the marks he makes fall in the green-colored “safety zone” on the card, you *know* your electrical system is right.

The regular record he keeps will show you when trouble is on the way—*let you correct it before it*

*happens.* You can spot voltage regulator troubles—too high settings that “burn out” batteries and cut the life of every replacement element in your truck’s electrical system, and too low settings that mean discharged batteries, frequent recharges and premature battery failures. Nothing else you can do will show it so clearly—nothing else takes the guesswork out of voltage regulation and battery maintenance!

We *know* this plan will save you money—and by using it in conjunction with Goodyear heavy-duty truck and bus batteries, you’ll save even more. So look into the plan today—give it a trial—and see for yourself what this battery maintenance plan will do for you. Send in the coupon now for full details.

# GOODYEAR

THE GREATEST NAME IN RUBBER

*Mail today  
and start saving!*

THE GOODYEAR TIRE & RUBBER COMPANY, INC.  
Dept. 729-C, Akron 16, Ohio.

I want to start saving on battery costs, so send me full information on the Goodyear Fleet Battery Maintenance Plan.

Name \_\_\_\_\_  
Firm Name \_\_\_\_\_  
Street Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_  
Number of Trucks in Fleet \_\_\_\_\_

# 30 States Have Rodeo Contests

Continued from Page 72

the championship in his class of competition. The current edition of the ATA booklet "Things the Professional Truck Driver Should Know" comprises a list of several hundred questions and answers and the questions for the written examinations will be based on them.

## Field Tests:

THE first test in this series of events is called "Inspection for Equipment Defects." Here the driver must inspect a vehicle as though he were making ready for a trip or tour of duty with the vehicle. The contestant is judged not only on his ability to locate the

defects in the vehicle but also on the efficiency of his method of inspection. A perfect score on this test will net the contestant a total of 10 credit points.

After completion of the "Inspection for Equipment Defects," the contestant chooses from the equipment on the field the vehicle he will use in the driving skill tests of the field tests. With the equipment of his choice, the contender is ready to pit his skill in handling the vehicle against all other entrants.

Contestants in the straight truck contest are allotted a maximum of eight (8) minutes to complete the driving skill test; those in the tractor semi-classes and truck full trailer classes are allotted a maximum of ten (10) minutes each for this purpose. When the allotted time elapses before the contestant finishes the skill tests the contestant will be disqualified.

The skill tests are laid out on the field in order and the contestants are walked over the course from test to test in sequence and what they must do in each test is explained to them. In competition each contestant must follow the sequence of the tests as shown him. He is required to back his vehicle through a line of three (3) barrels, moving to the left of the first, the right of the second and the left of the third. He then must drive his vehicle forward through the line of barrels moving to the right of the first, the left of the second and the right of the third. He is graded on the number of times his vehicle touches, scrapes, or knocks over the barrels and how smoothly he operates the vehicle. A perfect score in this test will credit him with 45 points.

The contestant is also required to drive his vehicle through the confines of an offset street or alley problem. He is graded in this test in the same manner as in the test which required him to weave his vehicle through the barrels or markers, and a perfect score in this test will net him 45 credit points.

(TURN TO PAGE 136, PLEASE)





## STOP COSTLY SKID ACCIDENTS

# Penetred®

## THERMODUCTOR

## SKID-CONTROL COILS

## FOR ALL YEAR 'ROUND

Penetred THERMODUCTOR Steel Claws give you Skid-Control and MAXIMUM DRIVING SAFETY all year 'round . . . Claws that cut thru ice and snow in winter, and slick road film in summer, for INSTANT ACTION . . . DEPENDABLE ACTION. No precious time wasted, no turning on the switch, and waiting for sand or grit . . . just apply the brakes, for SAFE Straight Line Stops . . . or step on the gas, for FASTER Starts without side Sway or slip.

### COOLER RUNNING

Penetred THERMODUCTOR Coils also reduce excessive heat that destroys vital tread rubber in regular tires, by conducting it out of the shoulder area . . . to give you the COOLEST running tire ever known.

### FEWER PUNCTURES

Penetred THERMODUCTOR Coils act as an armour plate and reduce punctures from 75 to 90 percent, by shunting off broken glass, nails and many other objects that otherwise cut and bruise the carcass, and keep it in better condition for the second and third retread . . . for longer mileage. Some records show from 35 to over 100 percent increase.

### Get a Free Demonstration

No words can describe the spectacular performance of Penetred Skid-Control . . . only your foot on the Brakes, or on the Gas can tell the story, for there is nothing in the world that gives you the "Feeling of Security" that Penetred gives you all year 'round . . . so get a Free demonstration today . . . in the meantime write for "The MIRACLES of Penetred."

## ASK

ANY TIRE SERVICE STATION ABOUT "PENETRED"

# PENETRED CORP. MARSHFIELD WISCONSIN



**PROVE IT OVER AND OVER AGAIN—**

# TOP MILEAGE!

**from the truckmen themselves!**



**INCREASED MILEAGE REDUCES COSTS!**

"We haul furniture from coast to coast, on all kinds of roads, in all kinds of weather, over mountains and across deserts at high sustained speeds. Kellys are giving us increased mileage, more recaps per tire and less road delays, all of which reduces our costs considerably."

**J. R. McEwan**

Operations Mgr., Republic Van & Storage Co.  
Los Angeles, Calif.



**KELLYS FOR BEST MILEAGE!** "We've used all brands of tires on our 75 trucks and we find that Kellys give us the best all-around service and mileage. Since using Kellys 100% we have substantially lowered our cost-per-mile, reduced tire failures to a minimum and gotten good, sound carcasses for recaps."

**Sam Joseph**

Olean Transportation Lines  
Elmira Heights, N. Y.

*Truc Trac  
Delivery*

*Truc Trac  
Highway*

*Commercial  
Heavy Tread*

*Dual Trac  
Special Service*

*Lug Trac  
Special Service*



## Rodeo Contests

Continued from Page 132

The contestant then must drive his vehicle in a straight line with the right wheels of the vehicle following a given path. The path allows sufficient space for the wheels to traverse the path without touching or moving the markers, but no more than sufficient space. The contestant is judged by the number of markers touched or moved by the wheels of the vehicle and whether

the wheels follow the designated path. By accomplishing this test perfectly the contestant can gain a maximum of 50 credit points.

In another test the driver must park his vehicle parallel to a curb between two parked vehicles, or within a given space. In the test, the tractor and semi-trailer driver must have the semi-trailer parallel to the curb. The event is judged on the distance the vehicle stops from the curb, whether the wheels bump or run over the curb in the maneuver and the number of times the vehicle touches or bumps the parked

vehicles or the other barriers used to mark the limits of the parking space. A perfect job of parking gains the contestant 50 credit points.

Yet another test requires the driver to park his vehicle at an alley dock which is located at the end of a confined space. The vehicle must not touch or bump the dock and must be within six (6) inches of the dock when the parking is completed to obtain the maximum score. In this test the driver is graded in a manner similar to that of the parallel parking event and by perfectly completing this maneuver the contestant gains 50 credit points.

The would-be champion must be able to drive his vehicle down a lane and stop at a given line. The contestant is scored on the distance the foremost part of his vehicle is away from the stop line. The vehicle must not be over the stop line and must be within two feet of it for any credit. For perfectly completing this test the contestant will achieve a credit point award of 25.

The amount of time the contestant uses to drive his vehicle through the course will count for or against him. If the contestant negotiates the driving skill tests using the average time allotted in his class of competition he will be awarded 25 credit points. Each contestant who performs the test for his class in either a faster or slower time than the average time, but within the prescribed time limits, will have credit points subtracted from his score. To win, the aspiring champion must be a smooth, safe and accurate driver.

A perfect score for the Equipment Defects Tests, the field tests, and the best time in maneuvering them gives the contestant a total of 300 points.

(TURN TO PAGE 138, PLEASE)

**DID YOU KNOW?**

### DID YOU KNOW?

A bundle of black widow spider webs no larger than a small pea will reach 350 miles if straightened out.



## MOLD-BLOK

BRAKE LINING

Did you know that years of research and experience in the heavy-duty braking field have gone into Mold-Blok? It is available in a friction range necessary to give you the best possible service. Specify Mold-Blok Brake Blocks for all jobs—old and new—it is a thoroughly dependable product.



Specify  
MOLD BLOK

## MOLDED MATERIALS DIVISION

OF

CARLISLE CORPORATION

RIDGWAY, PA.



"Oh, yeah! What ya mean a little knock-kneed?"



## HOW TO KEEP SIGHT-SEEING COACHES SIGHTLY...for more months...more miles



### APPROVED for leading NATIONAL FLEETS

Sherwin-Williams KEM Transport Enamels are approved and recommended finishes for the fleet equipment of Gray Line Sight-Seeing Tours—one of many large national fleet operators that have adopted Sherwin-Williams Automotive Finishes. This progressive organization offers visitors, to many of America's communities and scenic areas, well planned tours through selected places of interest, in coaches that are modern, attractive and well-kept.



Transport companies know that a bright, attractive finish has a direct bearing on the number of fares taken in. Sparkling, new-looking beauty attracts riders . . . makes the ride more enjoyable.

Keeping up appearances at minimum cost is a real challenge to the lasting qualities of the finishes used. That's why many transport systems approve or specify KEM® Transport Enamels as standard finishes. They've learned from experience that these finishes short-cut time out for refinishing and keep coaches new-looking longer.

KEM Transport Enamels are specially designed to resist effects of heat, cold, moisture, abrasion, grease and gasoline. They represent the highest type of synthetic formulation developed by Sherwin-Williams Research Laboratory.

Find out what these fast-drying, long-lasting finishes can mean in getting your equipment out of the paint shop sooner . . . keeping them out longer. Call your Sherwin-Williams "OK" Automotive Jobber today, or write for name of distributor nearest you. The Sherwin-Williams Co., Automotive Division, Cleveland 1, Ohio. (Export Sales Division, Newark, N. J.)

## SHERWIN-WILLIAMS

### AUTOMOTIVE FINISHES



## Rodeo Contests

Continued from Page 136

This, added to the perfect score of 100 credit points for the Appearance and Knowledge tests, makes a grand total of 400 credit points, the maximum obtainable.

The champion driver has to "know his stuff" relative to safe driving rules, the trucking industry, first aid and fire fighting. He has to be a champion in appearance, be well mannered and

courteous, and particularly he must be skilled in the use of his equipment—accurate and fast—but never sacrificing safety for speed.

### Penna. Rodeo

THE Pennsylvania Motor Truck Association is making plans to hold a State-wide Rodeo September 2-4 at Hershey, Pa. There will be no regional or district eliminations. All truck operators having terminals or offices in Pennsylvania are eligible to enter drivers. Three classes will be in competition—Straight Trucks, Tractor Single

Axle Semi-Trailers, and Tractor Tandem Axle Semi-Trailers. The contests will be conducted according to the state and national ATA truck rodeo rules, and the winner in each class will be sent with his wife to the National Championships in New York. Prizes and trophies will be awarded to the first three place winners in each class. Application blanks may be obtained from the Pennsylvania Motor Truck Association, Telegraph Building, Seventh Floor, Harrisburg, Penna.

END

Please Resume Reading Page 73

## PM Control Board

Continued from Page 67

The second division of the board is headed "Mechanics," where brads hold tags labeled with the names of our staff men. The mechanic who is assigned to the particular job has his tag hung on the corresponding "repairs" peg. In this way, any supervisor or company official can see what tractor is being given what work, and who has been assigned to do the job, thus providing accurate information on each unit in our fleet.

There is another section of the board devoted exclusively to lubrication and oil changes. We have always considered this portion of our maintenance program to be a very important segment, so have used this section of the board to make sure it is not overlooked. The tags hung on the brads under the "Oil Changes" section are labeled "oil" on one side, and the tractor number on the other. When the oil change, lubrication, battery check have been completed, the tag is turned with its number facing outward, indicating that the job has been done. The oil change period is weekly, with part of the highway fleet being done on Tuesday and part on Thursday.

We have found that a reminder about oil change and lubrication was needed. Many mechanics are tempted to slip up on this function. When the "OIL" label is outward on the control board, we have an instant check on the work scheduled for a day or night shift and a double check on when the work is done.

Coupled with work tags and other forms we use, we can check on an individual truck and place the blame properly should a failure result from improper lubrication.

(TURN TO PAGE 140, PLEASE)



# FAST, SAFE DEPENDABLE

## PORTABLE HYDRAULIC JACKS

- Scientific Design
- Precision Construction
- Rugged Performance

Seven Models—3, 5, 8, 12, 20, 30, and 50 tons capacity

● For the finest in rugged, fast-acting portable hydraulic jacks, standardize on Ajax. Whether you need a tool box truck or bus jack . . . a heavier duty unit for shop service . . . or a 30 or 50-ton brute for power bending and straightening—Ajax has a model to handle your requirements. In times like these, you'll find it more important than ever to standardize with one source for long jack service—for economical service—for dependable lifting equipment that will outlive the "emergency." See your Ajax Jobber.



Self-Locking Screw  
With Integral Cap



Extra-Strength  
Cylinder and Ram



Break-Proof Base  
And Pump Barrel



**AJAX AUTO PARTS CO.  
RACINE, WISCONSIN**

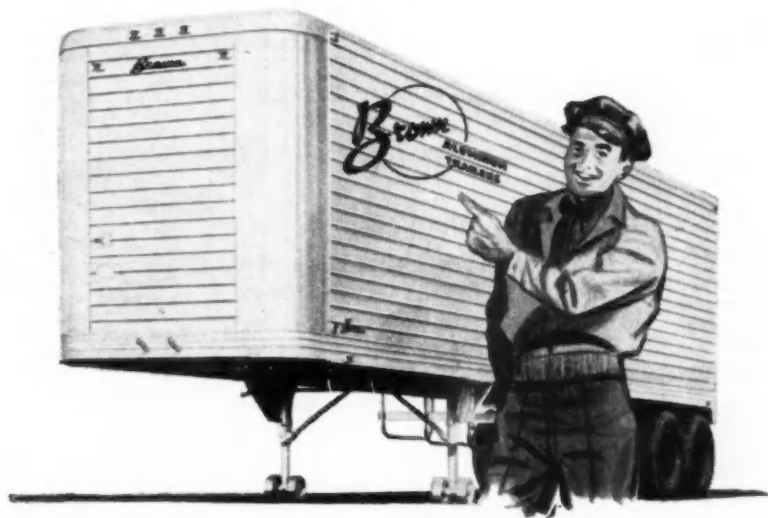


"THE COVERAGE LINE" OF FINEST QUALITY JACKS

# Want to know...

1. How to save 6% on every 20 tons?
2. How to save the price of one trailer out of every 16?
3. How to cover depreciation, interest and insurance with extra payload?

**Your Brown Distributor has the answers**



**T**HERE'S no guesswork about it. Brown Aluminum freight trailers will increase your payloads and your profits—reduce your overhead — give you more for your investment in trailers. It's a matter of operating records.

If you are being squeezed by higher costs on the one hand and low freight rates on the other — Brown Trailers will help solve your problem.

Your Brown distributor is prepared to give you facts. Ask him, he can help.

✓ Lighter Weight

✓ Bigger Payloads

✓ Increased Profits

**Brown**  
ALUMINUM TRAILERS

Toledo, Ohio   Spokane, Wash.  
Reading, Pa.  
Distributors in principal cities

**"This one clamp  
saves a dozen trips  
to the stockroom"**



## **"Aero-Seal"** WORM DRIVE HOSE CLAMPS

No need for a trip to the stockroom for a clamp to tighten a leaky hose. Overhaul after overhaul, season after season, the mechanic simply replaces the worn hose and re-uses the same Aero-Seal Hose Clamp.



### **WON'T CRIMP—CAN'T LEAK**

Worm drive applies even pressure all round the hose. Smooth saddle prevents cutting. No crimping—Aero-Seal can be replaced in any position. Three threads of worm always engage deep into slots of stainless steel band...hold hose tight over a million miles of roads!

### **REPLACE ANYWHERE—ANY TIME**



A man can install an Aero-Seal any place he can reach with thumb and finger. Integral construction—no parts to lose. Self-feeding when worm engages band. Screw-driver slot or thumb grip screw styles. Tighten with a twist of the wrist.

Use of stainless steel subject  
to government regulations.



**BREEZE CORPORATIONS, INC.**  
41 South Sixth St., Newark, N. J.

## **PM Control Board**

Continued from Page 138

### **Job Operations Coded**

WHEN we divided our maintenance and repair work into the 19 subdivisions, we coded each of them with classification numbers. These numbers begin at 50000.

The jobs and numbers run like this: 50000, valve grind, engine overhaul; 50001, replace engine, bell housing; 50002 clutch, rear end; 50003, motor tune up; 50004, spring assembly; 50005, steering assembly; 50006, body, chassis repairs; 50007, starters, generators, etc.; 50008, inspection routine (bi-monthly); 50009, lights, switches, etc.; 50010, universal joints, drive shaft, wheels; 50011, windshield wiper, mirror, etc.; 50012, cooling and water system; 50013, differential, axle shafts, wheels; 50014, fifth wheel; 50015, brakes; 50016, trailer brakes, etc.; 50017, trailer repairs; 50018, tire changes. These are listed at the bottom of the board in individual spaces.

**END**

*Please Resume Reading Page 68*

### **IHC Safety Film**

One of the year's outstanding topical films, "Day In Court," issued by International Harvester Company, offers both a challenge and a message to motorists and others interested in traffic safety, is being shown to civic and business leaders interested in promoting safety.

The picture, a sound film produced in Hollywood and a presentation of International Harvester Company, attacks the problem of traffic safety. Much of the film's action takes place in court.

The picture deals with one method used in improving the Los Angeles traffic fatality record to the point where it is one of the best in the nation. The theme points out that in courteous driving lies the key to traffic safety. It shows how motorists' bad driving habits lead them into trouble, with appearance in court, property damage, injury, and even death resulting.

Provisions can be made for showing the film on a no cost basis by applying through the local offices of Modern Talking Pictures, Inc.

## **Budd Wheel Distributors provide the same service described in this advertisement**

AKRON—Motor Rim Manufacturers Co.  
ALBANY—Wheels, Incorporated  
ALBUQUERQUE—Wheels & Brakes, Inc.  
ATLANTA—Harris Automotive Service, Inc.

BALTIMORE—R. W. Norris & Sons, Inc.  
BIRMINGHAM—Wheel, Rim & Parts Co.  
BOSTON—New England Wheel & Rim Co.  
BUFFALO—Frey, the Wheelman, Inc.  
CHARLOTTE—Carolina Rim & Wheel Co.  
CHICAGO—Stone Wheel, Inc.  
CINCINNATI—Rim & Wheel Service, Inc.  
CLEVELAND—Motor Rim Manufacturers Co.  
COLUMBUS—Hayes Wheel & Spring Service  
DALLAS—Southwest Wheel, Inc.  
DAVENPORT—Stone Wheel, Inc.  
DAYTON—Rim & Wheel Service, Inc.  
DENVER—Quinn & McGill Motor Supply Co.  
DES MOINES—Des Moines Wheel & Rim Co.  
DETROIT—H. & H. Wheel Service, Inc.  
EVANSVILLE—Auto Wheel & Rim Service Co., Inc.  
FARGO—Wheel Service Company  
FORT WAYNE—Wheel & Rim Sales Co.  
GRAND RAPIDS—Rim & Wheel Service Co.  
HARRISBURG—Standard Rim & Wheel Co.  
HARTFORD—Connecticut Wheel & Rim Co.  
HOUSTON—Southwest Wheel & Equipment  
INDIANAPOLIS—Indiana Wheel & Rim Co.  
JACKSONVILLE—Southeast Wheel & Rim Co.  
KANSAS CITY—Borbein, Young & Co.  
KNOXVILLE—Harris Automotive Service, Inc.  
LOS ANGELES—Wheel Industries, Inc.  
LOUISVILLE—Auto Wheel & Rim Service  
MEMPHIS—Beller Wheel, Brake & Supply Co.  
MILWAUKEE—Stone Manufacturing Co.  
MOLINE—Mutual Wheel Co.  
NASHVILLE—Beller Wheel, Brake & Supply Co.  
NEWARK—Automotive Safety Inc.  
NEW HAVEN—Connecticut Wheel & Rim Co.  
NEW ORLEANS—Southern Wheel & Rim Co.  
NEW YORK—Wheels, Incorporated  
OKLAHOMA CITY—Southwest Wheel, Inc.  
OMAHA—Morgan Wheel & Equipment Co., Inc.  
PEORIA—Peoria Wheel & Rim Co.  
PHILADELPHIA—Thomas Wheel & Rim Co., Inc.  
PITTSBURGH—Wheel & Rim Sales Co.  
PORTLAND—Six Robblees', Inc.  
PROVIDENCE—New England Wheel & Rim Company  
RALEIGH—Carolina Rim & Wheel Co.  
RICHMOND—Dixie Wheel Co., Inc.  
ROCHESTER—Frey, the Wheelman, Inc.  
SALT LAKE CITY—Henderson Rim & Wheel Service  
SAN ANTONIO—Southwest Wheel & Equipment  
SAN FRANCISCO—Wheel Industries, Inc.  
SEATTLE—Six Robblees', Inc.  
SOUTH BEND—Wire & Disc Wheel & Sales Service  
SPOKANE—Bearing & Rim Supply Co.  
SPRINGFIELD, ILL.—Illinois Wheel & Brake Co.  
SPRINGFIELD, MO.—Borbein, Young & Co.  
ST. LOUIS—Borbein, Young & Co.  
ST. PAUL—Wheel Service Co.  
SYRACUSE—Colbourn Wheel & Rim Service, Inc.  
TACOMA—Six Robblees', Inc.  
TOLEDO—Wheel & Rim Sales Co.  
WICHITA—Borbein, Young & Co.  
WINSTON-SALEM—United-Automotive Service

### **EXPORT**

CLEVELAND—C. O. Brandes, Inc.

### **CANADA**

CALGARY—Fisk Tire Service Ltd.  
EDMONTON—Alberta Wheel Distributors, Ltd.  
MONTREAL—Auto Wheels & Supplies, Ltd.  
TORONTO—Wheel & Rim Co. of Canada, Ltd.  
VANCOUVER—Wheels & Equipment, Ltd.  
WINNIPEG—Ft. Garry Tire Service Ltd.





## GANGWAY!

Up this gangway goes a bulldozer. A *big* bulldozer that weighs approximately 5 tons!

To haul this equipment, Don Di Milt, maintenance foreman for R. C. Siebert, designed a special chassis for their 1½-ton Dodge truck. The springs and frame were built up to carry 17,500# GVW.

Originally, the truck had 700x20—8-ply tires. Naturally, these could not carry the load.

On advice of Bud Fritz of Frey, The Wheelman, Inc., Budd wheel distributor in Rochester, and Lee Lewis, Jr., of Scanlon Lewis Tire Company, the truck was changed over to 825x20—12-ply tires on 6.50 Budd wide-base wheels.

As Bud Fritz states, "We got at this trouble before it started."

If you want to keep *your* trucks out of trouble, why not ask your Budd wheel distributor at the left to give them a look. His advice won't cost you a cent, and may save you many dollars.

The Budd Company, Detroit 14.



**GENUINE**

**Budd**

COLD TAPERED DISC

**WHEEL**

*Specify and Standardize  
on Budd Wheels*

## LEGAL CORNER



## License Fees Must Be Paid In Advance

PHILARD, INC., operates a truck fleet in South Dakota. He is exclusively engaged in wiring farm houses and buildings for electricity and in building rural electric lines.

This is a privately owned and operated commercial truck fleet. However, the state decided that the trucks should carry commercial carrier compensation plates and when Philard refused to buy them, arrested one of his drivers and prosecuted him and Philard for operating an improperly registered vehicle.

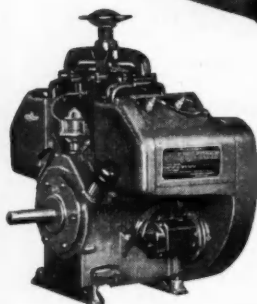
They told him that unless he bought the plates they would tie up his entire fleet. Philard's lawyer told him that under the law he didn't need to buy this license and went to court to get an injunction to keep the police from stopping the drivers until the case was decided. The court granted it and the state appealed. The Supreme Court said that a truckman cannot get an injunction, but must pay the fee, protest, and sue to get the money back.

In case of doubt, in order to keep a fleet rolling, an operator, henceforth, must pay any taxes or fees claimed no matter how flimsy the excuse to levy the tax. If he wins he gets his money back, but the government will hold the money until the case is decided.

## Give a Thought to WISCONSIN Heavy-Duty Air-Cooled ENGINES

for your Refrigeration Units

This tractor-trailer conditioner unit is powered by a Model VE-4 Wisconsin 4-cylinder engine.



Body builders, refrigeration engineers and fleet owners alike, who are familiar with Wisconsin Heavy-Duty Air-Cooled Engines, have a keen appreciation of such advantages as:

**DEPENDABLE AIR COOLING.** No cooling problems at any temperature from sub-zero to maximum summer or tropical heat.

**COMPACT DESIGN.** Wisconsin Engines are readily adaptable to available space allocations without sacrificing payload area. V-type design of 4-cylinder models assures an extremely compact power package.

**HEAVY-DUTY SERVICEABILITY.** The crankshaft of every Wisconsin Engine carries Timken self-cleaning Tapered Roller Bearings at both ends to take up end thrusts and radial loads, permitting direct drive from the extended crankshaft without need for a separate thrust or outboard bearing. We have yet to hear of a single case of Wisconsin Engine bearing failure.

**ROTARY TYPE, HIGH TENSION OUTSIDE MAGNETO,** equipped with Impulse Coupling, for smooth, steady ignition, easy starting in any weather, and minimum servicing.

Wisconsin engineers will be glad to work with you in planning your Refrigeration and Conditioner Power installations. Let us have a look at your blueprints and specifications and see what we can come up with.



## WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines  
MILWAUKEE 46, WISCONSIN

## And As A Reminder . . .

Flagmen are required for construction hauling.

A 13,000-lb dump truck belonging to Rudy's Dump Truck Co. of Los Angeles recently backed over a workman who was on the ramp leading from the bottom of an excavation where Rudy was hauling out the fill. The California Court of Appeals held the truck company, not the contractor who hired the workman responsible. The judge said there is a duty on the part of a carrier to post a flagman on the roadway and keep it safe.

Workmen Compensation provides no protection for the truck company in this situation as the workman was not working for the truck company. Nor did it make any difference that the contractor's men knew they were not supposed to be on the ramp. It is up to the hauler to see that the road is safe and he is responsible if someone gets in the way of one of the trucks and is hurt. The driver was backing down the ramp slowly and carefully, but still the court said there should be a flagman on the ramp as it is impossible to see all around behind a dump truck.

Another trucking company proves  
that your best investment for  
high safety and low maintenance  
costs is an ASF Safety 5th Wheel...

# "What counts with us is Positive Coupling"

While it's true that accidental uncoupling of any trailer is no joke, it just seems to go double when you're hauling tons of chemicals or acids. With that kind of payload there simply can't be any compromise with safe, positive coupling.

V. D. Ecoff, President of Ecoff Trucking Inc., operating out of Fortville, Indiana, has practically all his tractors equipped with ASF Safety 5th Wheels... and has this to say about their performance:

"We used to have trouble with 5th wheels because of wear and looseness, but since we started buying ASF wheels we've licked the problem. What counts with us is positive coupling, as proved by the time a train hit one of our tanks and carried it  $\frac{3}{4}$  of a mile. Your 5th wheel pulled right off of the tractor without uncoupling.

"Believe it or not, we're now using that same ASF wheel on another tractor."

Naturally, Mr. Ecoff would be the last one to recommend an accident as a standard test for 5th wheel coupling

strength. But it does prove that ASF 5th Wheels are built to take just about anything that heavy loads and tough service can dish out.

The strength and ruggedness of ASF 5th Wheels pay off with higher safety... and with low maintenance costs during everyday operation! Get all the facts on the best 5th wheel investment you can make. Write us for information—and name of your nearest ASF Distributor. American Steel Foundries, Automotive Division, 410 North Michigan Avenue, Chicago 11, Illinois.

*Make an investment in safety...with*

## ASF safety 5<sup>th</sup> wheels

## ASF Safety 5<sup>th</sup> Wheels



**A 3000-pound "compression-grip" saves your maintenance dollars...**

**COUPLING**—as the king-pin enters the jaws, the jaws are forced back against the exclusive ASF rubber buffer block, building up compression.

**COMPRESSING**—3000 pounds are built up before the lock clears the rear jaw, allowing it to snap to locked position.

**LOCKED**—and the jaws remain under compression. The grip is like a vise; eliminates the slack and backlash that can cost you money in added 5th wheel and king-pin wear.



**A quick glance tells you the lock is locked...**

**LOCKED**—as quickly shown by the lever position. The easy-to-see lever can *only* be in this position when the jaws are truly locked.

**UNLOCKING**—with an easy twist of the wrist. Simply move the safety dog up, and pull the lever forward.

**UNLOCKED**—and ready for coupling. The lever moves back to locked position *only* when the jaws are locked!



# How-Why-Where Engines Wear

Continued from Page 66

appear that high wear could be nearly eliminated by changes in those engine operating conditions that are contributing. Such an approach, however, is unrealistic, if not impossible. For instance, it is difficult to conceive of a gasoline powered door-to-door delivery vehicle operating under continuous high-output, high temperature condi-

tions, or a diesel pumping engine operating always at low load and high temperatures on the highest quality fuel. The question then arises, can high rates of wear be reduced by other means?

Two fleet tests have been conducted on the Pacific Coast which provide insight to a means of wear-prevention.

The first fleet, in which seven engines were measured, was in a city utility service. The second, in which six engine makes in the 200-240 cu in. class were represented, was a city delivery operation. These fleets totaled 59 vehicles, of which 17 were measured and inspected. The procedure was the same in both of these fleet tests; the engines were opened in the frames and then reassembled without change or cleaning after the cylinders were measured. The vehicles had run on a heavy duty oil from 5870 to 14,187 miles (from new) before the first inspection. A highly alkaline oil was then put into the engines, and its use continued for additional mileages ranging from 8792 to 18,827, when a final cylinder measurement was made. The oil change interval was 1500 miles during both phases of the test. These tests in door-to-door delivery vehicles differed from the first fleet in that three units began the test on an oil of high alkalinity.

Not only was the wear rate reduced a little more than 50 per cent by the use of the highly alkaline oil in those instances where comparison is possible, but the wear rates with these lubricants are such that cylinder bore life of 60,000 to more than 100,000 miles is indicated. This is exceptional for this type of service. A measure of oil alkalinity is available for the highly alkaline oils in the Utilities Fleet tests. A considerable concentration of base remains in the oil at the completion of the 1500 miles of service prior to the oil change. These oils, when new, possess alkalinity equivalent to a total base number (TBN-E) of 6.0 or 7.0 as determined by ASTM Method D664-49. The average heavy duty lubricant, if we exclude from consideration Series 2 oils or those meeting the old Supplemental List 1 revision of the 2-104B Specification, show TBN-E values ranging from about 1.5 to 3.5 when new. We would expect that in these fleet tests the basicity of both the premium and heavy duty oils would be zero at the end of 1500 miles of such severe operation.

(TURN TO PAGE 148, PLEASE)



## HOW TO PREVENT *Costly Delays*

**Do the Obvious Thing:  
Put On Servis Recorders**

When a truck manager installs a Servis Recorder on a truck, a number of things begin to happen:

- he gets on his desk every morning a little chart that shows all the truck did yesterday.
- he then knows how often the truck stood idle, and exactly how long — all day.
- he knows whether it was taken out at night without permission.
- the chart shows him whether *this* truck has too much work to do, compared with the others.
- knowing the truck's route, he can tell whether it did any speeding (making up lost time).
- if the truck gets in after hours, the chart shows him whether extra pay for overtime is justified.
- and the New Model shows on the chart if the Recorder was opened during the day — and when.

*All this the SERVIS RECORDER does — and more. Write for our booklet — "Ten Ways of Getting More Work Out of Motor Trucks."*

**THE SERVICE  
RECORDER CO.**  
1275 Euclid Ave. Cleveland 15, O.

All you need  
is a Screw Driver  
and 3 Screws!

**The Servis Recorder**  
Shows Busy and Idle Time . . . All Day

RIGHT UP  
IN THE CAB





"I think Harry'd do better on a day run, personally"

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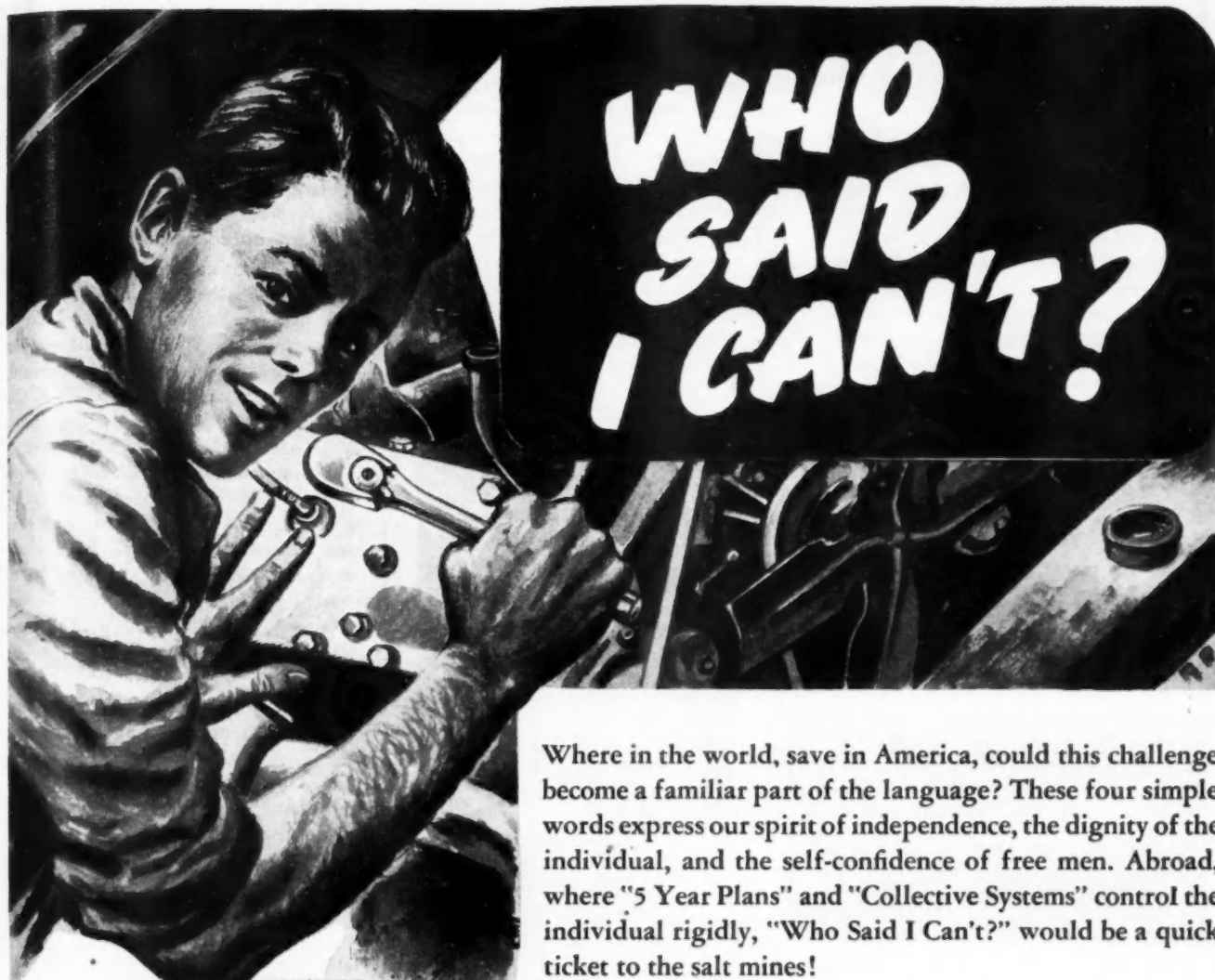
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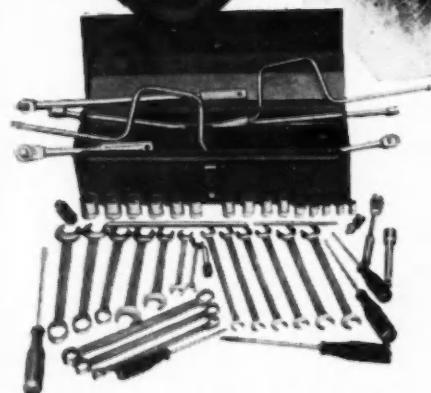
July, 1952



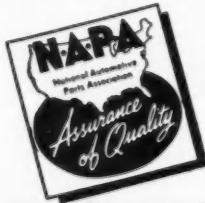
Where in the world, save in America, could this challenge become a familiar part of the language? These four simple words express our spirit of independence, the dignity of the individual, and the self-confidence of free men. Abroad, where "5 Year Plans" and "Collective Systems" control the individual rigidly, "Who Said I Can't?" would be a quick ticket to the salt mines!

Analyze that big statement in four little words a bit. Think of "Who Said I Can't?" in terms of a man's relationship with his boss . . . his neighbor . . . or, in your own day-to-day problems of meeting and overcoming obstacles — handling your job — accomplishing things.

In boom times or bad in this *free* country, real mechanics working with good Hand Tools stand up and challenge with an emphatic "Who Said I Can't?" It's American, brother, and it's still very much yours . . . don't let anyone take that birthright away from you. Let's keep our American system — and work to make it better.



**NOTE TO MECHANICS:** Here are the good Hand Tools of your trade. From slim, powerful Sockets and dependable Flat Wrenches to the ingenious, time-saving, special Tools for automotive work, you'll find New Britain has everything you demand in practical utility plus solid quality. Ask your Jobber to show you this money-making Set No. 6050.



# New Britain

## HAND TOOLS

**GREATER STRENGTH • BETTER FIT**  
THE NEW BRITAIN MACHINE CO. • NEW BRITAIN, CONN.

COMMERCIAL CAR JOURNAL, July, 1952

## Engine Wear

Continued from Page 146

These results indicate quite convincingly that cylinder bore wear can be reduced in engines operating under severe conditions by a change in crankcase lubricating oil alone. It is indicated, furthermore, that a high level of alkalinity in the lubricant is the contributing factor to this wear reduction. This influence of lubricating oil alkalinity on wear rate has been studied

further in extensive laboratory testing.

This mechanism of wear prevention that has been assumed implies that any change in engine operating conditions which affects the forces which drive the acidic combustion products through the cylinder wall oil film will affect the wear rate. This has been found to be the case. As would be expected, these driving forces may be altered by changing the partial pressures of the combustion gases. This may be demonstrated by an increase in imep through added load. The effect of load reduction in decreasing wear is clearly evi-

dent. Engine speed, on the other hand, should have no effect on corrosive wear if imep is not changed. That is, the total length of time the oil film is exposed to the corrosive atmosphere is equal regardless of engine speed. At high speeds the film is exposed many times for short intervals; at low speeds the reverse is true and in both cases exposure durations are equal.

The migration of corrosive combustion products through the oil film under the driving forces involved may be affected also by cylinder wall temperatures, and any change in temperature conditions in the cylinder and ring zone should be manifested in the wear curve. A laboratory engine was operated for 240 hours at a cylinder jacket temperature of 100 F. The temperature was then raised to 160 F. The total wear was immediately reduced by a factor of more than four as indicated by the sharp decrease in the slope of the wear curve.

In this brief discussion of the wear mechanism the effect of increasing the alkaline barrier in the oil film as well as the effect of changing engine operating conditions to alter the driving forces on the migrating corrosive particles have been surveyed. These driving forces also can be raised by increasing the partial pressures of the corrosive particles in the combustion zone through an increase in their concentration. A convenient means for doing this is to increase the fuel-sulfur content.

In summary, it may be sufficient to note from these observations that the three conditions which increase corrosion in the cylinder zone are about equally important: high load factors can cause critical conditions of corrosion; corrosive wear is rapidly accelerated by low cylinder wall tempera-

(TURN TO PAGE 150, PLEASE)

# new

NOW IN ONE PACKAGE

a complete set of  
*Monmouth*  
main bearings

TO THE AUTOMOTIVE REPAIR TRADE THIS MEANS—  
Increased sales  
Time saved in ordering  
Time saved in stock keeping  
Elimination of dead inventory

TO THE CAR OR TRUCK OWNER THIS MEANS—  
Complete service

AN ENGINE is only as good as its connecting rod and main bearings. When these bearings become worn they should be replaced in sets. Each Monmouth Main Bearing set carton contains all Main Bearings required to complete a bearing installation. They are regularly furnished in standard sizes with the usual range of undersizes. These sets are available now. You don't need to wait for future deliveries. Ask your NAPA Jobber.



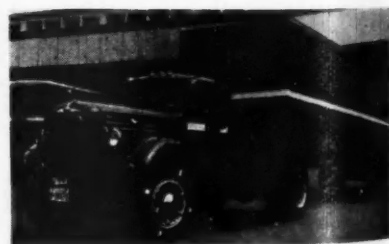
\*The words Monmouth, Clevite and Micro are registered trade marks of The Cleveland Graphite Bronze Co.

THE CLEVELAND  
GRAPHITE BRONZE CO.  
REPLACEMENT SALES DIVISION  
6500 Carnegie Ave. • Cleveland 2, Ohio

**CGB FIRSTS:** The development of continuous strip casting, 1929—thinwall babbitt lined steel-backed bushings, 1931—continuous casting of copper lead on steel strip, 1934—tri-metal bearings, 1938—Micro\* Bearings, 1939—Clevite\* 77, 1944—and others which have helped to revolutionize the lined bearing industry.



## Trucks Take Over



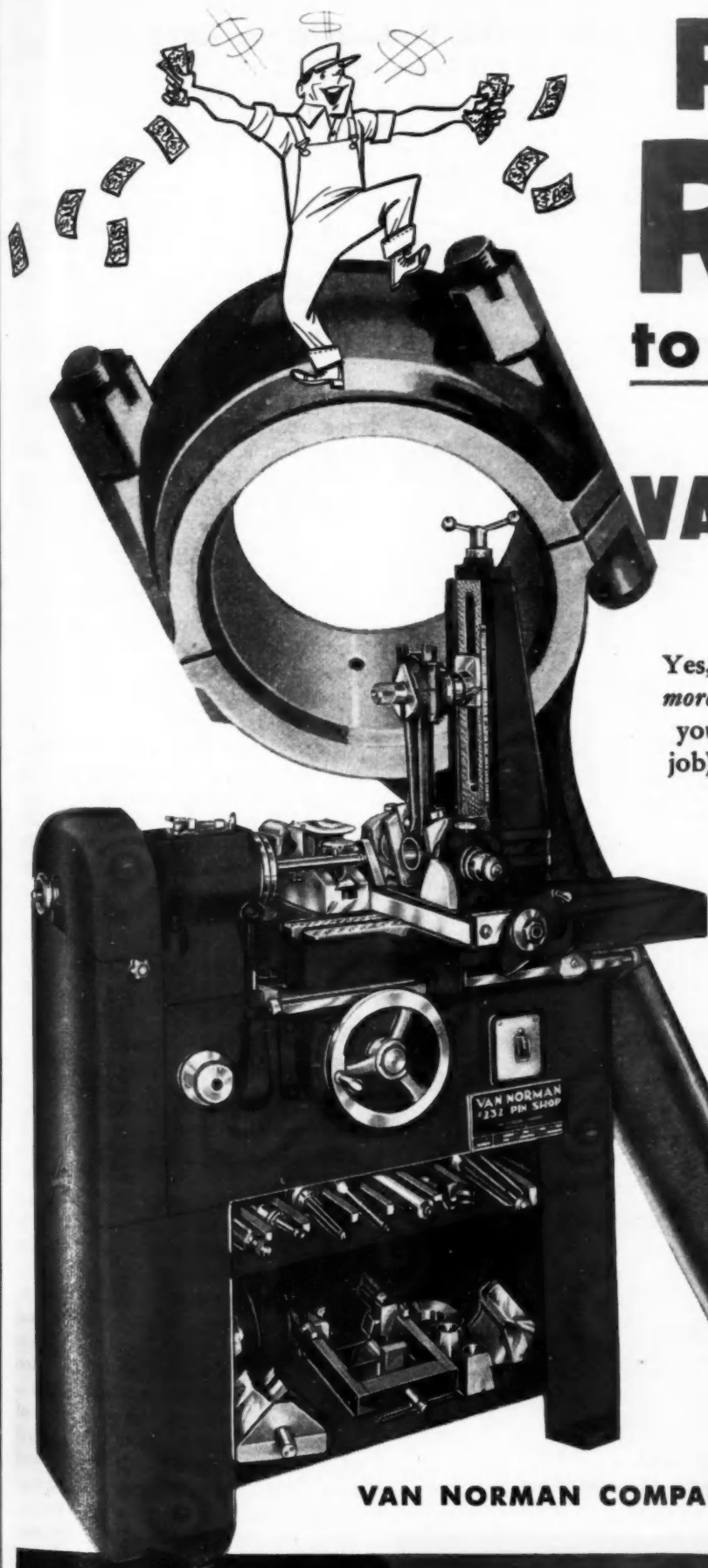
The latest chapter in the truck-by-mail story comes from Long Island, N. Y., where 32 vehicles took over all third and fourth class mail transportation from the Long Island Railroad. The fleet consists of A-30H Macks, 23 tractors and nine trucks with 40 Trailmobile trailers.



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July, 1952



# Ride the RODS to New Profits with VAN NORMAN'S No. 232

Yes, rod money is big money . . . and *far more money* than piston and pin work (which you get anyway, when you get the rod job). Here's your market — *all* engines with rods elongated over .002"!

And here's the machine for you to *merchandise* to that market . . . Van Norman's No. 232. It does a *complete* job . . . reconditions rod-ends, fits pins to rods to car manufacturer's tolerances, then fits pins to pistons . . . and does it *faster* than any other method.

Remember . . . "*rods are hot*" . . . the hottest market for repair work today! So see your jobber now about the No. 232 deal, or write Van Norman Company, Springfield 7, Mass.



VAN NORMAN COMPANY, Springfield 7, Mass.

**The Best-Equipped Shop  
Gets the Business!**

that's why *"It Pays to Van Normanize"*

## Engine Wear

Continued from Page 148

tures; and fuel in which the sulfur content has been raised to one per cent is equal in importance to the factors as a wear promoter in the severe laboratory test employed. Furthermore, the high wear attributable to any or all of these factors may be, in large part, alleviated by the use of lubricating oils possessing high concentrations of alkalinity.

Fifteen cars were tested for a period of fifteen months, during which time approximately 14,000 miles were covered by each car. The operating schedule used was designed to represent average or typical passenger car service, and the principal factor investigated was the effect of heavy duty oil on engine wear and engine deposit formation. From the results obtained in this

## H. D. Oils Reduce Wear Rate

J. L. Palmer—Lubrizol Corp.

test program the following observations are made:

The use of a heavy duty crankcase oil, in the MIL-0-2104 quality range, has the following effects on engine wear and engine deposits, when comparison is made with a non-additive oil:

a. Piston ring wear is reduced, on the average by 37 per cent.

b. Cylinder bore wear is reduced, on the average, by 42 per cent.

c. Engine cleanliness is significantly improved. In terms of CRC merit ratings, the cleanliness is increased, on the average, from 53 to 78.

Triplicate tests on each oil showed good repeatability of engine wear and deposit results. For this reason the results are considered to be significant, and will adequately serve as a background of data upon which the base future laboratory research work.

The cost of operating a fleet of passenger cars in this manner is approximately \$100 per month per car. This amount is not considered to be excessive when comparison is made with the cost of full-scale laboratory engine tests and similar research work conducted in this field.

### Detergent Oils Reduce Engine Wear

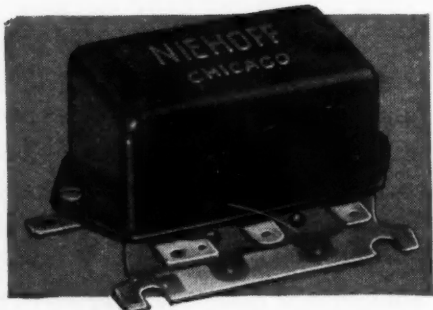
H. R. Jackson  
Atlantic Refining Co.

The second wear program is of a less specialized nature in that it involves the effect of high versus low detergent oils on wear in winter time passenger car service. The passenger car test was run this past winter in Philadelphia, and was an uncontrolled test in that normal to and from work driving was employed. The cars on test represented various makes and ages, and were tested "as found," with the exception that the top front piston ring in each car was replaced with a radioactive ring for the purposes of wear measurements. Using this method of wear determination, it was found that wear could be accurately determined in as little as one week's operation. The two oils tested in this program were typical of those which are available in some service stations, oil A containing a relatively small amount of detergent, oil B containing a rela-

(TURN TO PAGE 155, PLEASE)

# NIEHOFF

## WARRANTED IGNITION PARTS



## Keep 'em rolling trouble-free!

Today, join the hundreds of cost-conscious fleet owners who place their trust in Niehoff parts. Make your own tests. You'll discover that with Niehoff ignition sparking your motors, lay-up-losses melt away.

Built-in *quality's* what does it . . .

All Niehoff parts are warranted for 90 days or 4000 miles. Built for every make and model—trucks, cars, buses. Ready-reference, *streamlined* catalog. See your jobber; or write us.

**C. E. NIEHOFF & CO.**

4925 LAWRENCE AVE. • CHICAGO 30, ILLINOIS

#### BRANCHES

Boston 34, Mass., 254 Brighton Ave.  
Los Angeles 15, Cal., 1330 W. Olympic Blvd.  
New York 19, N.Y., 250 W. 54th St.

**C. E. NIEHOFF & CO.**  
*30th Anniversary Year*

## Engine Wear

Continued from Page 150

tively high amount. Since both these oils had previously been evaluated in the COT cold jacket tests, it is interesting to compare the results of the two tests.

Figure one shows the relative protection of the two oils with varying cylinder wall temperatures as determined by the COT engine tests. These tests show that the spread in wear between Oil A and Oil B varies with cylinder wall temperature in the 80 deg F to 180 deg F range. These differences in wear are due to the difference in corrosion protection ability of the two oils.

### Methods of Measuring Wear

Moore and Kent—Union Oil Co.

Wear measurements on engines are made to predict the service performance of the engine, or more usually some particular parts of the engine such as cylinders and rings under some set of operating conditions. There are at present two popular methods for measuring wear rate, namely, the direct physical measurement of the worn parts, and the less direct measurement of radioactive material worn off on an irradiated part. There is also a third method, somewhat less popular, which measures engine wear by chemical analysis for iron appearing in the used lubricating oil.

The direct approach to the problem of wear measurement is to run the engine under the selected operating conditions for a certain period of time and simply "mike" the parts we are interested in. We should, of course, have measured these same parts before the start of the test, and by subtracting the final measurements from the initial measurements we arrive at the amount of wear that has occurred. If the engine parts in question have any reasonable life, it is necessary to run a long time before enough wear has occurred to be measured with any degree of certainty. For example, liner wear rates of less than 0.002 in. per 1000 hours are considered desirable in one make of diesel. Since measurements of liner diameter much closer than .001 in. are difficult to make, 500 hours is about the minimum time required for a single wear test.

If we try to repeat this test, using a new piston and liner of the same design and let us say from the same pro-

duction lot, we will find the amount of wear occurring under the selected test conditions will not be exactly the same, even within the accuracy of our micrometer readings. Minor differences in surface finish or hardness or in mechanical fit can make large enough differences in wear rates to spoil the reproducibility to some extent. Vagaries of the break-in process and even differences in the torquing of nuts can add to the uncertainties of wear measurements by the direct method.

For designers of engines and their

component parts, the direct physical measurement of wear is frequently the only applicable method.

Another method which has proved to be more precise and quicker than direct measurement is that of analyzing the used oil for the iron worn from the moving parts of the engine. The method owes its precision to the fact that as little as one-tenth part of iron per million can be detected in lubricating oil, and iron contents in the range of 5 to 100 parts per million can be determined

(TURN TO NEXT PAGE, PLEASE)

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## Engine Wear

Continued from Page 155

with accuracy of 5 to 10 per cent. Translated into terms of cylinder and ring wear, this corresponds to the measurement of change in cylinder diameter of 7 millionths of an inch, with an accuracy of 3 or 5 ten millionths of an inch. The high sensitivity of the method allows significant wear values to be obtained in short tests, of 50 to 100 hours. Furthermore, the engine does not need

to be dismantled to obtain the measurements. Thus mechanical factors such as surface finish, break-in, or distortion can be practically eliminated as a variable affecting wear results. Also, a large number of tests can be made in the same engine between the time when it is broken in and the time when it is worn out, under practically constant mechanical conditions.

The measurement of wear by use of radioactive piston rings has attracted considerable interest in the past few years, largely because the method is extremely sensitive and changes in

wear rates occurring in a few minutes or a few hours can be readily measured. The effect of a large number of operating variables can be measured in a short period of time, measurements that might have required years to make by direct physical methods. The effects of transitory phenomenon, such as the effect of changing from an oil of high wear rate to one of low wear rate, can be observed, which would be impossible to detect by any other method. It is estimated that the radioactive method is several hundred times more sensitive than the iron analysis method. It would be almost ridiculous to think of measuring a tenth of a millionth of an inch by direct physical means. Needless to say, the engine is not dismantled to make radioactive wear measurements, so that mechanical factors should not influence wear values.

The radioactive methods offer an advantage over the iron analysis method in that there is no question as to where the iron in the lubricating oil came from. It can only come from the radioactive part, usually an irradiated piston ring. This fact may also be a disadvantage, for it is often assumed that the wear rate of the piston ring is the same as the wear rate of the cylinder wall. Such a one to one relationship between ring wear and cylinder wall wear is not necessarily true. One can speculate that under conditions of corrosive wear, large areas of the cylinder wall are exposed to the corrosive gases. The piston ring, on the other hand, is in contact with the cylinder and is relatively protected from the corrosive gases. Therefore, it might be expected that cylinder wear would be higher than ring wear under some circumstances. In many cases the rate of wear on the top ring is of the same order of magnitude as the rate of wear on the cylinder. However, there are data to show that under low jacket temperature conditions and with high sulfur fuels, a certain oil effected a substantial reduction in top ring wear over that obtained with a reference oil, whereas the reduction in cylinder wear with this oil was relatively minor.

END

Please Resume Reading Page 67

## Obedience

Terminal Superintendent: "Didn't you read the note I sent you some days ago?"

City Delivery Driver: "Yes, sir, inside and outside. On the inside it said, 'You are fired,' but on the outside it said, 'Return in five days.' So here I am."

COMMERCIAL CAR JOURNAL, July, 1951

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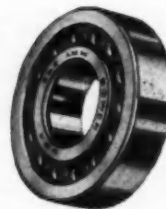
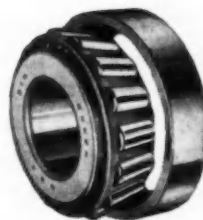
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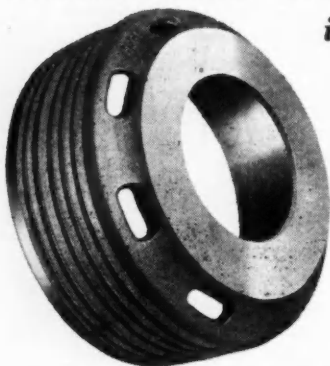
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## Additive Oils

Continued from Page 59

clearly shown. Other concentrations of heavy-duty additive in lubricating oils were used in this field test. Higher concentrations of additive did not appear to be any more effective than the Supplemental 1 level. Supplemental 2 to U. S. Army Specification 2-104-B was not tested as laboratory engine tests indicated little additional or economical improvement could be expected from excessively high concentrations. Lower concentrations, however, were tested. From the data on all oils, it is believed that the Supplemental 1 level of additive concentration is the optimum based on performance and economy.

It might be expected that high ash oils would increase valve deposits and accelerate valve and spark plug failure. In the approximate five million miles run in this particular field test, there was no decrease in valve or spark plug life with the high additive oils. To further check as to whether high additive oils would add to combustion chamber deposits and decrease valve and spark plug life, two such oils with two different additives were used in tire test fleets in Texas. These tire test fleets operate at constant speed under conditions conducive to rapid formation of combustion chamber deposits and short valve and spark plug life. After over a million miles in these tire test fleets, the trend has been toward an improvement in valve and spark plug life, and a reduction in combustion chamber deposits, rather than to the contrary as might have been expected. Where an increase in valve life was obtained, it was rather spectacular and where an engine experienced a decrease in valve life with the use of the high additive oils, it has been a small decrease of such little magnitude as to be considered a deviation from the average. The only explanation for the apparent improvement in valve life and reduction of combustion chamber deposits is that the metal in the ash from the oil and the lead compounds from the lead-tetraethyl in the fuel have different rates of thermo-expansion and that they, perhaps in expansion or contraction, slide against each other and sluff off. In any event, it would appear that there is nothing to fear through the use of high additive oils as far as valve life and spark plug life are concerned. As a matter of fact, there is some indication that longer valve and spark plug life can be obtained with some high additive oils.

(TURN TO PAGE 162, PLEASE)



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## Additive Oils

Continued from Page 158

Another very interesting feature of the high additive oils are the beneficial effects of reducing wear and rust. Gulf Research & Development Co. has developed a severe cold room engine corrosion test. The correlation between this test and field operating conditions is unknown. However, this laboratory cold room engine corrosion test, while accelerated, should certainly indicate

a trend in low temperature, light load service.

From the data shown in Fig. 5 it may readily be seen that Supplemental 1 level oil gives only about 20 per cent of the wear that is obtained with Premium type motor oil. In the chart below are shown the results of rust formation with a Premium type oil and a Supplemental 1 type of oil in this same engine corrosion test. These data illustrate the excellent rust preventive characteristics of the high additive oils.

To pictorially illustrate the wear and rust characteristics of premium oils as

compared to high additive oils, in Fig. 6 is shown a section of a crankshaft operated in this engine test on a premium oil and in Fig. 7 is shown a section of a crankshaft operated at the same time and under the same conditions on a Supplemental 1 oil. It is believed that these last two pictures are quite striking in showing the effect and alleviation of cold corrosion of bearing journals either from water or inorganic acids formed in the combustion process. The high alkalinity of some high additive oils tends to overcome this acid action and thus reduce wear.

One of the most persistent ideas regarding heavy-duty oils regardless of the concentration of additive in the oil is that they will wash or clean deposits already formed in the engine. While it is true that an engine in the laboratory may be operated in such a manner as to purposely form oil deposits and that when this same engine is subsequently operated on a heavy-duty oil, the deposits will be all or partially removed, it is the author's experience of never having seen an engine in the field which failed due to heavy-duty oils washing down deposits or causing them to migrate. Many such instances have been reported, but it is believed that if these complaints had been studied thoroughly, some other reason for failure would have been found.

### Break-in Characteristics

Mr. Helmuth G. Braendel, Director of Engineering and Production for the Wilkening Manufacturing Corp., presented a paper entitled "Ring, Piston, and Cylinder Assembly" at the annual SAE Meeting in Detroit in January of this year. A portion of this paper was devoted to "Effect of Highly Additive Oil on Ring and Cylinder Seating." In his paper Mr. Braendel states "Recently, a problem of rather serious proportions has appeared in the operation of heavy-duty commercial engines during the first several thousand miles of operation of either new or rebuilt engines. Many operators have experienced a sharp increase of failures because of lack of seating of the rings and the cylinders during this initial operating period. In heavily loaded engines which are critical on cylinder distortion, this will result in excessive blow-by which will overheat the piston, stick the rings, and may induce scuffing and scoring of the piston ring and cylinder assembly. . . . In engines which are not critical with regard to cylinder distortion, or which are not heavily loaded, it results in excessive oil consumption for extremely long periods of time, sometimes indefinitely. A study of the causes of this lack of

(TURN TO PAGE 164, PLEASE)

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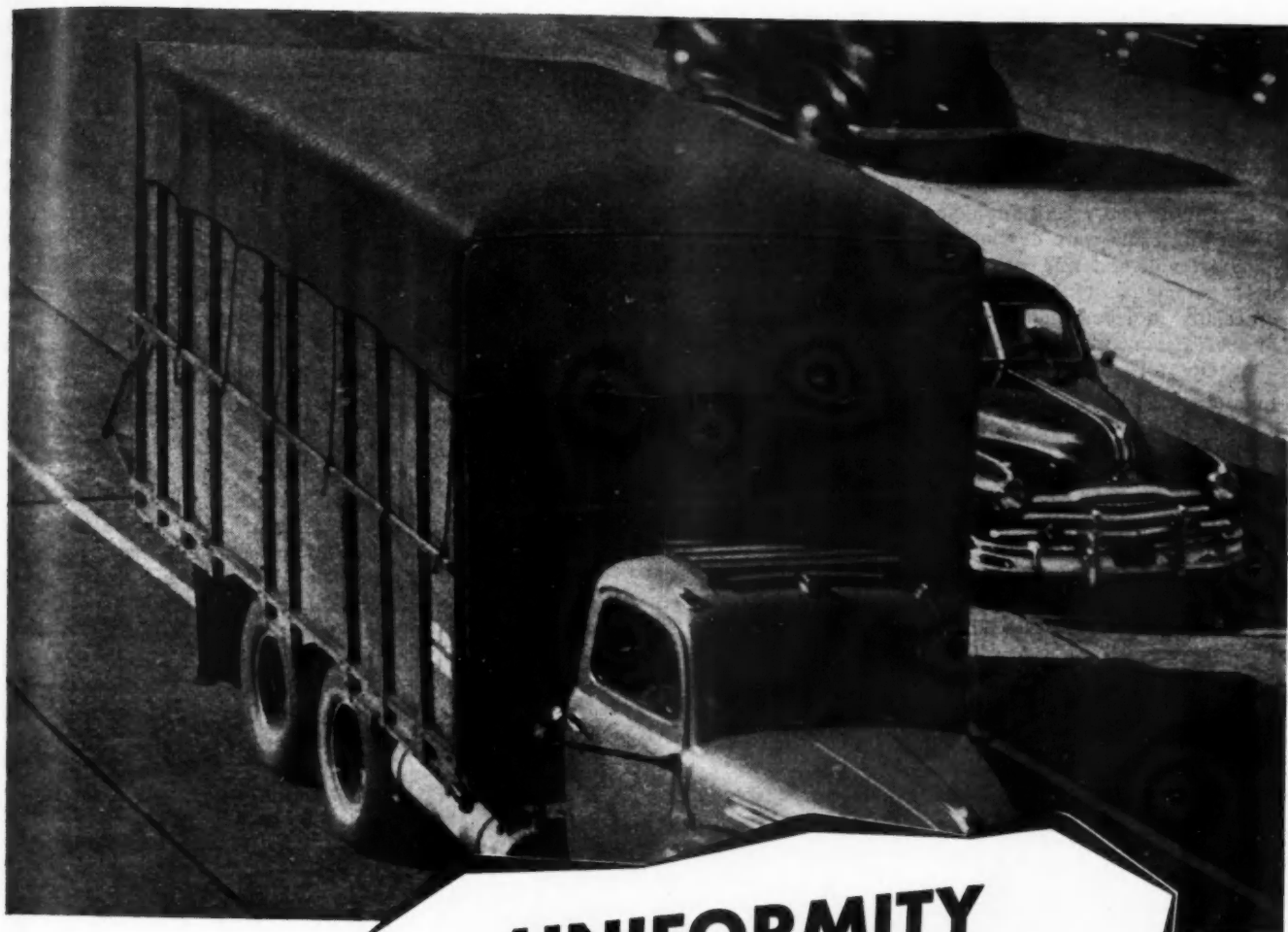
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## Additive Oils

Continued from Page 162

seating pointed to the use of the 2-104 heavily additive lubricants, such as MIL, Supplement 1, and Supplement 2. These lubricants were developed to reduce cylinder and ring wear in heavy-duty automotive type Diesel engines, especially in connection with the use of fuels having high sulphur content."

Mr. Braendel further states—"Fortunately, in this case the problem can

be easily solved by using a non-additive, or a lightly additive lubricant during the first several thousand miles of operation so that the initial seating, which is absolutely essential, can take place." In further connection with the above statements, the author has been informed that they do not apply to all makes or types of additives. The author agrees with Mr. Braendel in his first statement in regard to engines which are critical on cylinder distortion in over-the-road type of service, but believes that the trouble is not due to the type of oil used, but

rather to the critical condition of cylinder distortion and lack of proper heat transfer.

With regard to the second statement concerning engines which "are not critical with regard to cylinder distortion, or which are not heavily loaded, and result in excessive oil consumption for extremely long periods of time, sometimes indefinitely," the author must disagree. In Fig. 8 are shown the results of field tests of 30,000 mile duration on each engine using a Supplemental 1 and a Premium motor oil. These engines were not critical with regard to cylinder distortion nor were they heavily loaded. As may be seen, oil consumption was not excessive with the high additive oil and, as a matter of fact, it may also be seen that oil consumption became increasingly better with the Supplemental 1 oil than the Premium oil as the engines accumulated mileage.

With regard to Mr. Braendel's third statement involving the use of a non-additive or lightly additive oil during the first several thousand miles of operation, the author agrees that this might be of help under certain conditions such as in engines which have top chrome rings or which have cylinder walls otherwise treated to prevent wear. Chrome rings and treated cylinder walls are for the purpose of reducing wear. Among the functions of high additive oils is that of reducing wear. Break-in is wear. Therefore, anything which contributes to reduction of wear will prolong the break-in period.

Figure 8 shows that the break-in period on the lightly loaded engines using the Supplemental 1 oil was extended some 4,000 to 5,000 miles beyond those engines using Premium type oil. However, consumption could not be considered excessive in any case during the break-in period.

END

Please Resume Reading Page 60

### Goodwill Builder



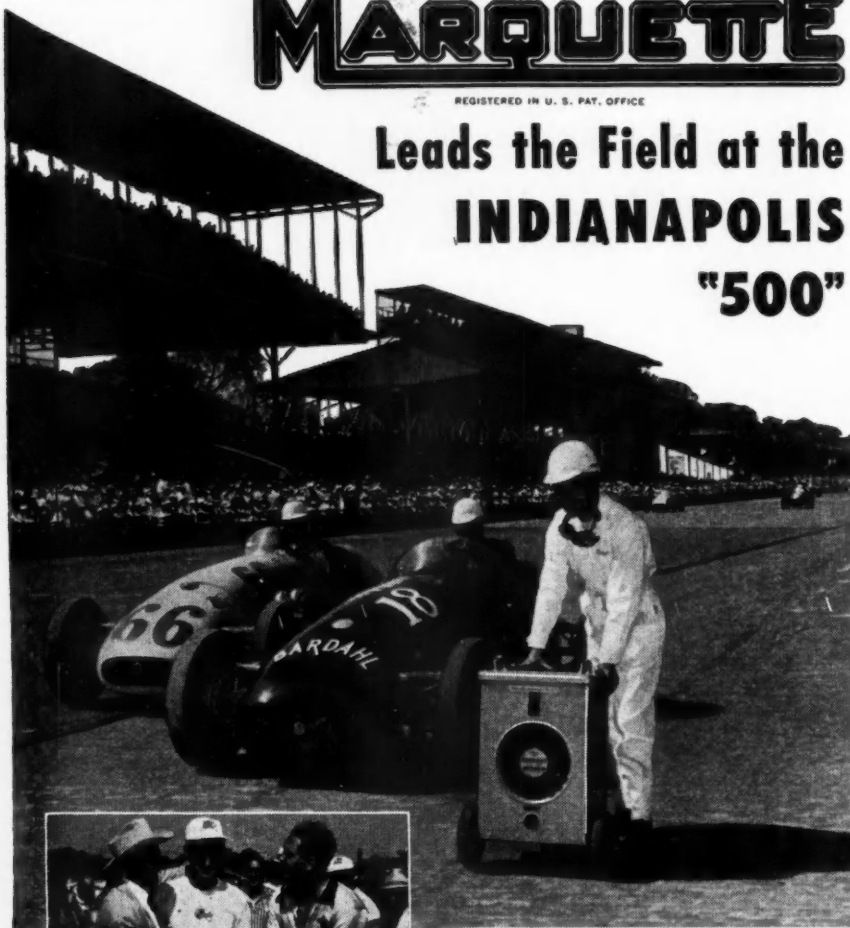
Using its new Dorsey van as a rolling billboard was one way to build community goodwill for Bonded Distribution Co., Pensacola, Fla. The signs advertised the "Fiesta of Five Flags" held annually in Pensacola in the late Spring.

COMMERCIAL CAR JOURNAL, July, 1952

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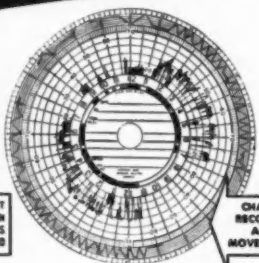
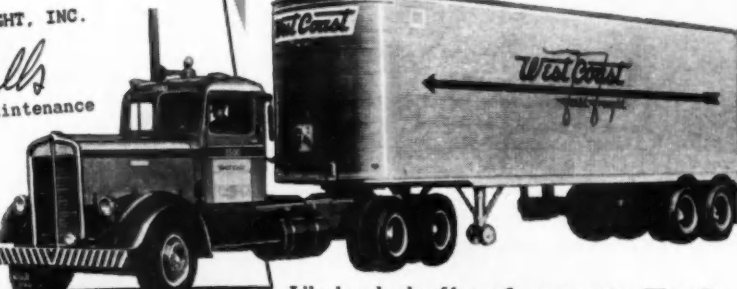
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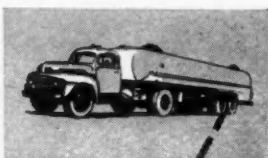
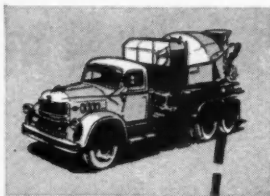
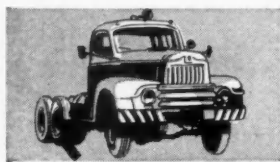
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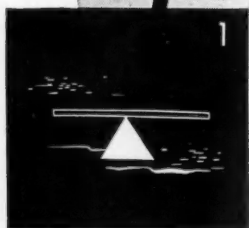
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## Battle Area PM

Continued from Page 71

very hard on tires, and maintenance is extremely high. One of the biggest items of supply is hot patches for repairing tire breaks.

Another important difficulty facing Ordnance maintenance officers in Korea is the lack of skilled mechanics. The principal reason is that Army personnel for the most part is composed of draftees and younger men in the age ranges of 18 to 20, who have never had commercial experience prior to their induction. Training programs are constantly in progress, but because of the rotation plan, by the time a man is trained he is practically ready for transfer. As a result of the shortage of skilled mechanics, repair activities are based more on replacement of units than actual repair, with those removed sent back to base shops for overhaul. However, some repair of smaller units such as starters, generators, carburetors and similar items is accomplished in the field through use of special kits. A common practice is to exchange such units, requiring a turn-in of the unserviceable item for direct exchange, with no paper work involved. In this way hoarding of equipment is prevented and essential transportation is kept moving. Another common practice is to take good serviceable parts off vehicles that are awaiting return to a rear area for rebuild and put them in the exchange pool, and to replace the good unit with one that has been turned in.

Maintenance procedures as used in Korea are primarily the same as those followed in World War II and which worked very successfully. The first echelon naturally is the drivers who are responsible for lubrication, oil changes, fan belts, and general reporting of any deficiencies. The second echelon is responsible for a preventive maintenance check every six months or 6000 miles, tune-up, checking of the frame, packing of wheel bearings, and similar operations. It also replaces starters, generators, and other service assemblies. Replacement of major sub-assemblies is a third echelon operation, or in some cases, a fourth echelon. The division between these two brackets is a very indefinite one. Both, of course, do some rebuilding of components, but with facilities and trained personnel very limited in Korea, most of the rebuilt jobs are sent out of the country to the Ordnance shops in Japan.

Ordnance still has the mobile shop arrangement for front operations similar to those employed during World

(TURN TO PAGE 168, PLEASE)

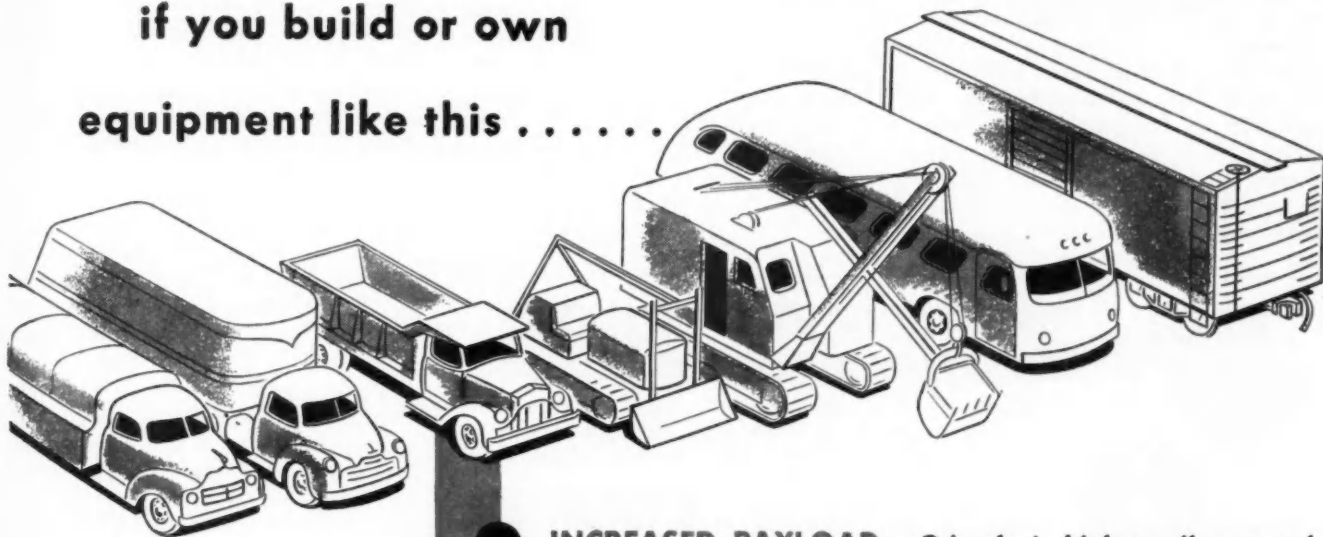
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**INCREASED PAYLOAD**—Otiscology's high tensile strength permits the use of lighter sections without loss of strength—cuts equipment deadweight which allows for greater profit-paying cargo.

**LOWER COSTS**—Lighter sections with equivalent strength frequently make possible the production of 1/3 more units per ton compared with mild steel—result in 1/3 lower freight cost per unit—1/3 less weight handled during production.

**CORROSION RESISTANCE**—Otiscology has 4 to 6 times greater resistance to atmospheric corrosion than mild steel—helps lengthen equipment service life—cut maintenance costs.

**FATIGUE RESISTANCE**—Otiscology has high resistance to fatigue—considerably greater than that of mild steel.

**WORKABILITY**—Otiscology can be easily welded or cold formed by any standard method.

**J&L  
STEEL**

It's no surprise builders and users of transportation equipment are turning to high-tensile J&L Otiscology to give them machines that require minimum maintenance—help increase income through reduced deadweight and greater payloads.

When you're looking for new ways to cut costs on your equipment, you'll also find it well worth your while to check further into the advantages of J&L Otiscology, the modern transportation steel. Why not write us for additional information *today*?

**JONES & LAUGHLIN STEEL CORPORATION**

**PITTSBURGH 30, PA.**



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"lady in the cookie business."

COMMERCIAL CHAMBER OF COMMERCE July 1952

11400

## Battle Area PM

Continued from Page 166

War II. It also is using an extensive van storage set-up under which large van trailers are stationed at forward depots for storage of parts, but which can be quickly evacuated in case of emergency by simply attaching to truck tractors. One Ordnance medium maintenance company, which is an operation of considerable size, reported that it could completely evacuate its position

and move all its equipment and supplies out in a matter of six hours.

### Alaska Proving Ground

THE Arctic Test Branch of the Army Field Forces is running a year-round proving ground for Ordnance combat and tactical vehicles and other military equipment under arctic and sub-arctic conditions. Located at Big Delta, Alaska, about 105 miles southeast of Fairbanks, the ATB area is ideally situated from the standpoint of both terrain and climate for testing tanks and other vehicles. Terrain consists of

mountains, tundra, valleys, frozen lakes, rivers, mud flats, windpacked snow, glaciers, deep snow, and bogs. Temperatures range down to 70 deg below zero F, to 90 deg above. Rapid temperature changes also are frequent, varying as much as 68 deg within a few hours.

Out of the continuing search for better fuels, cold-weather lubricants, year-round coolants, and climatological data may come some important developments of value to the automotive industry and its customers. One of the chief problems at ATB is the effect of extreme cold on both life and operation of vehicles. When temperatures drop to -30 to -40 deg F lubricants congeal to a semi-solid state and act as binders; batteries lose up to 90 per cent of their power and will freeze if not properly charged; water in gasoline freezes clogging the fuel supply; rubber items become brittle, resulting in failures of fan belts, seals, and tires and tubes; metal becomes brittle and loses its impact resistance; brake fluids become sluggish, and engines will not start.

Several developments already are in use to combat the cold weather operation of vehicles in Alaska. A new sub-zero oil under test has a pour point of -50 deg F and a minimum flash point of 320 deg F. Specifications call for wear, ring-sticking, and oxidation characteristics similar to that of SAE 10W. While still under test, the oil has been approved for all equipment that can use 10W oil. Its effective range is from -5 deg to 32 deg above zero. Above that temperature, consumption increases. Under some conditions, the new oil has a tendency to excessive consumption, although this may be due to need for better engine conditioning as to rings and seals, since the trouble usually occurs with older engines. Special arctic lubricants also have been developed and are in use for transmis-

(TURN TO PAGE 170, PLEASE)



**ROCKLAND COACHES**

*Looks for Trouble  
and Finds **LOWER COSTS***

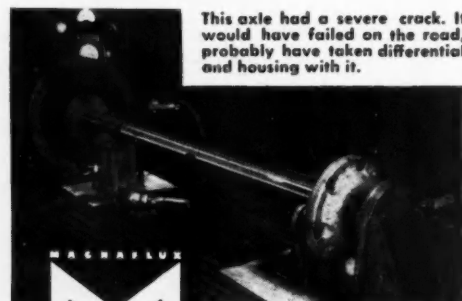
*Uses Preventive Inspection  
with **MAGNAFLUX**  
to Prevent Road Failures*

Magnaflux bath being applied to crankshaft. Defects that are otherwise invisible become clearly marked indications.



A broken spindle can destroy a bus—and injure passengers. Inspection with Magnaflux "spots" approaching failure before it can do damage.

This axle had a severe crack. It would have failed on the road, probably have taken differential and housing with it.



### MAGNAFLUX CORPORATION

5908 Northwest Highway • Chicago 31, Illinois

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Export Distributor: Curtis Wright Corp. • In Canada: Williams & Wilson, Ltd.

Rockland Coaches, Spring Valley, N. Y., has found that regular preventive inspection with Magnaflux practically eliminates road failures. It is now an "indispensable" part of operations, that pays for itself many times over by keeping their fleet of 78 busses on the road earning money, more profitably.

For example, 8 to 10 axles a year used to break on the road. Costs for replacement, loss of revenue, etc., averaged about \$300 per failure. In two years since using inspection with Magnaflux not a single axle has failed on the road.

Crankshaft breakage that often destroyed or severely damaged an engine is almost a thing of the past. Even new shafts are Magnaflux-inspected and defective ones are returned to the manufacturer.

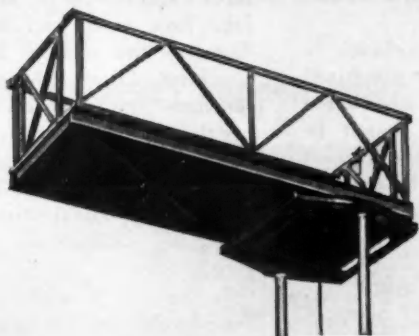
Differential gears, connecting rods, steering knuckles, and spindles—even engine bolts—are inspected. In every case, unpredicted failure has been reduced to a negligible factor.

INSPECTION WITH MAGNAFLUX IS AVAILABLE TO YOU THROUGH MAGNAFLUX' OWN LABORATORIES AS WELL AS MAGNAFLUX-LICENSED OVERHAUL SHOPS. WRITE US FOR THE LOCATION OF THE ONE NEAREST TO YOU.

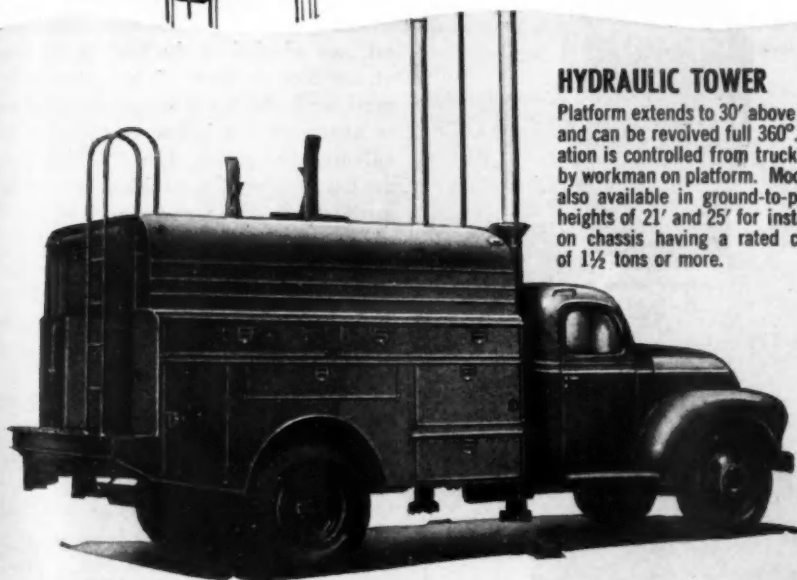


"It's a steal at that price; only two thousand miles . . . owned by an old lady in the cookie business."

# "The Accepted Standard with Utilities Everywhere"



Proved by many years of trouble-free service, *Powers-American* bodies set the pace as the number one choice with utilities everywhere . . . the measurement of top quality and performance throughout the industry. "Job-engineering" steps up crew efficiency, lowers operating costs . . . protects your investment. *Powers-American* has the type body and equipment to do your particular job most efficiently and at lowest cost.



## HYDRAULIC TOWER

Platform extends to 30' above ground and can be revolved full 360°. Operation is controlled from truck cab or by workman on platform. Models are also available in ground-to-platform heights of 21' and 25' for installation on chassis having a rated capacity of 1½ tons or more.

# POWERS

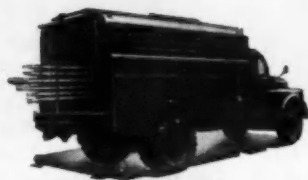


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DIVISION

PUBLIC UTILITY BODIES AND EQUIPMENT

McCABE-POWERS AUTO BODY COMPANY  
5908 North Broadway, Saint Louis 15, Missouri



## LINE CONSTRUCTION BODY (600)

Available in 9' to 14' lengths, equipped to meet individual needs in any phase of utility work.



## REVOLVING AERIAL LADDER

Models available in working heights of 23' 6", 26' 6", 30' 6", and 32' 6" for all styles of bodies.



## LIGHT CONSTRUCTION BODY (SERIES 35)

Ideally suited for all types of light duty maintenance and construction work.



## MAINTENANCE BODY (400)

Designed for medium duty general service. May be furnished with winch and derrick capable of handling 40' poles.

There are many styles of *Powers-American* Bodies not shown here. Write for descriptive catalog today.



## Battle Area PM

Continued from Page 168

sions and differentials which will operate satisfactorily down to  $-65$  deg. A brake fluid has been developed which remains effective at temperatures ranging down to  $-80$  deg.

A new type battery also is in use having 4 to 8 more plates per cell than normal batteries. It has greater ampere hour capacity at higher voltage.

Tests with fan belts have resulted in

development of a new compound of rubber from which belts are made that will retain their flexibility at temperatures down to  $-65$  deg. With ordinary fan belts, brittleness and breakage result at low temperature. Wear characteristics of the new fan belt are equal to previous types.

Because of the problems relating to coolants, ATB has adopted a pre-mixed year-round anti-freeze for use where water and ethylene glycol cannot be readily mixed or stored. It is shipped pre-mixed and consists of ethylene glycol, di-methoxy ethanol and a corrosion

inhibitor. Its freeze point is  $-80$  deg and flash point is 260 deg.

Another interesting project result is a new low temperature tire, developed in connection with the rubber industry. Because of the extreme low temperatures encountered in Alaska, tires and tubes become stiff and failures are high. The new tire remains flexible at temperatures down to  $-54$  deg, but has the same characteristics as normal rubber tires at average temperatures. Tread wear is normal and loss of air is less than with regular tires. At 21,850 miles of test, about half the tire life remained, indicating satisfactory wear performance.

In the area of cold weather starting, considerable work is being done on pre-heating with an auxiliary system. One unit, developed in cooperation with Stewart-Warner, now is being used. It is gasoline-fueled and operates by heating the engine coolant which then is circulated to the battery block and manifold. Exhaust gases from the heater are directed against the crankcase. A fiber glass insulating cover also is placed around the engine to prevent heat loss. The heater can be operated continuously to keep the engine warm all night, or be used to preheat a cold engine.

The use of external heat, sub-arctic oil, and alcohol in the fuel at the rate of one pint to about 20 gal permits operation of vehicles in temperatures down to about 40 deg below zero, but these aids to cold starting do not fully satisfy the field forces. The problem of starting in the field, where garaging is not possible has been partially met, but there still is considerable work to do. Another interesting cold weather problem has to do with seals. Rubber becomes stiff, causing the seal to break, with resultant leakage. Considerable research is going on to find a compound that will remain flexible and still have the required sealing characteristics. Leather and other composition seals also cause difficulty under extreme cold. One difficulty arises from condensation of moisture inside the engine, which freezes seals to shafts and other moving parts. When the engine is started after being cold-soaked for several hours, the seal sticks to the shaft and is chewed to bits.

END

Please Resume Reading Page 72

### The Squelch

"I see you have your left arm in a sling. Broken, isn't it?"  
 "Yes sir, it's broken."  
 "Did you meet with an accident?"  
 "No. Broke it trying to pat myself on the back."  
 "Pat Scott? What for?"  
 "For minding my own business."

COMMERCIAL CAR JOURNAL, July, 1952

## New Arrow Magnalite

New lens design • Less weight • Better appearance

### LOW-COST CLASS "A" SIGNALS

with revolutionary new  
Magnalume Lens

**New, more efficient prism design.** Here is a lens so well designed, so effective, that it needs no reflector. The Magnalume Lens gives you greater safety through greater visibility. It is guaranteed fade-proof and not to crack or draw.

**Makes possible narrower, lighter lamp.** Because the Magnalite needs no reflector, you get a narrow, neater lamp. Width of the double-faced Magnalite, for instance, is less than  $2\frac{1}{4}$ ". Lighter in weight, the Magnalite places less vibration strain on fenders.

**Three types available.** For light and heavy trucks as well as buses. The flush-mounted Magnalite protrudes less than  $\frac{1}{2}$ ". The single-faced and double-faced Magnalites, which can be mounted on fender or bracket, are less than  $4\frac{1}{2}$ " in diameter. Baked black enamel finish. Bulbs easily replaced with foolproof snap ring. Magnalites also available in kits with switches.



**Model N-260** — All Magnalite Directional Signal Sets are equipped with this switch. Built-in flasher. Positive proof indicator. Unconditionally guaranteed. **ORDER NOW!**



ARROW SAFETY DEVICE COMPANY  
MOUNT HOLLY, NEW JERSEY



N-128—Double-faced Magnalite.



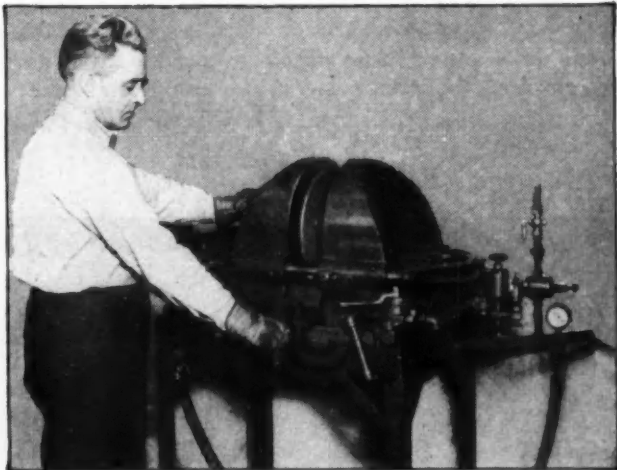
N-129—Flush-mounted Magnalite.

# original equipment line!

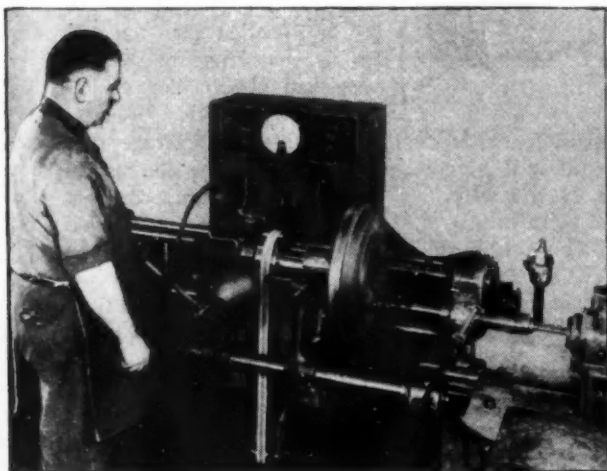
Here's why it doesn't happen when you do use **GENUINE LIPE CLUTCH PARTS**



**CHECKING RUN-OUT** — Each driven disc assembly is rotated between centers on a splined arbor and checked with micro-instruments to insure actual running conditions within practical operating tolerances. All disc assemblies showing excess run-out tolerances are corrected to insure true parallelism between pressure plate and flywheel surfaces.



**CHECKING FLATNESS** — Run-out alone does not determine driven disc function. Hence, each driven disc assembly is finally rotated between two master surface plates whose surfaces are in true parallelism. The distance between these two plates is equivalent to the minimum plate separation within which the disc operates in actual service.



**BALANCING THE CLUTCH** — Today's newer and faster engines demand balanced parts. And precision Lipe equipment assures this balance. All clutch assemblies, new and reconditioned, are subjected to static and dynamic balancing on special machines designed by Lipe-Rollway. Smooth "vibration free" operation is insured by the close tolerance limitations of this procedure.



**FINAL INSPECTION** — All clutches pass through these final inspection fixtures for checking plate separation and parallelism. Designed and built by Lipe-Rollway, they duplicate actual installation conditions. At this inspection point, a record is made by serial number of the controlling dimensions of each assembly and therefore becomes a part of our permanent service record.



**FREE** — Wall Chart showing Lipe Type ML Clutch adjustment procedure...also Clutch Service Manuals on Type TC and Type ML Clutches. Write for copies.

Authorized Lipe Service Stations are located from coast to coast. For quick service on genuine Lipe parts, look for this ad in the yellow pages of telephone directories in principal cities.



# Who Pays for Highway Costs

Continued from Page 53

owners were paying substantially less than their fair share. Worthy of mention in this category was the study made by Messrs. Breed, Older and Downs for the Association of American Railroads. This study assigned motor vehicle owners whopping percentages of 91, 91 and 48, respectively.

Because there are so many imponderables involved in seeking an an-

swer to this first fundamental question, there is a growing tendency to by-pass it and to assume that motor vehicle owners should pay the portion of the bill they are now paying or more.

We in the trucking industry cannot afford to allow this question to be ignored or by-passed. Motor vehicle owners already are contributing heavily toward the support of roads and streets

which by no means can be justified on the basis of motor vehicles travel or motor vehicle taxes generated.

Moreover, the demand for such roads and streets is growing steadily in view of the rapid decentralization of populations and industries. Motor vehicle owners simply cannot afford to pay the cost of every desired back road and street in the United States.

Motor vehicle owners, including the trucking industry, should demand a fair allocation of highway and street cost as between themselves and the other beneficiaries.

Assuming this is done, then we come to the second fundamental question, namely:

How should the portion of the cost properly assignable to motor vehicles be distributed among the different types of motor vehicles?

## Three Key Theories

SEVERAL theories or methods for distributing highway cost among different classes of motor vehicles have been advanced from time to time. But in order to keep this discussion within reasonable limits, we shall deal here only with the three which have been getting most consideration. They are:

1. The gross ton-mile tax theory.
2. The operating cost theory.
3. The incremental theory.

The so-called gross-ton mile tax theory assumes that, for vehicles of every type and size, motor vehicle tax responsibility should be measured by multiplying the average gross weight of the vehicle by the miles traveled, and then distributing the total tax responsibility among all vehicles, or all weight groups of vehicles, in proportion to this product.

It's as simple as that. It is this simplicity and ease of application which has caused a number of highway tax technicians to adopt it. Others, notably the railroads, have taken it to their bosoms because of the high level of taxes which it applies to large trucks.

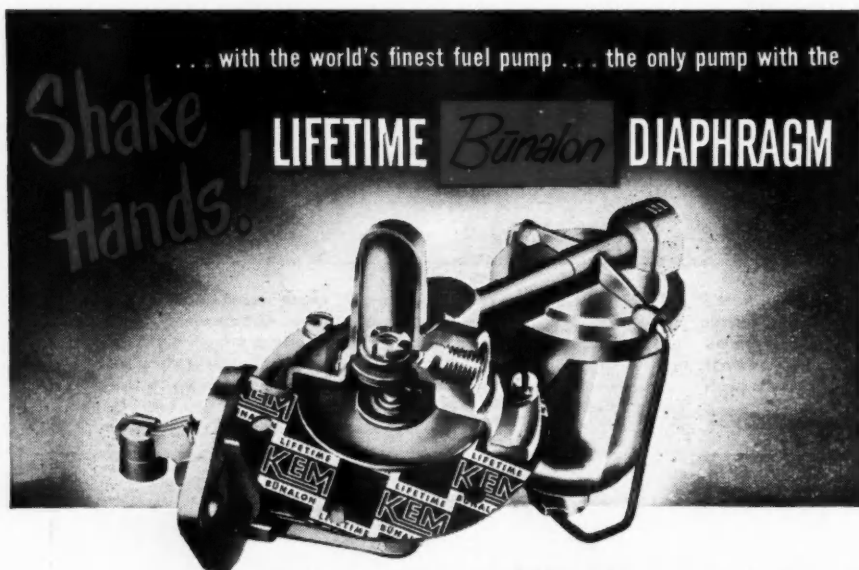
Fig. 3 gives an idea of how this would work out in a typical state where the registration fee for a passenger car is \$10 and for a 40,000 lb gvw truck, is \$195.

For comparison, let us assume the passenger car operates 9500 miles a year, and the 40,000-lb truck runs 45,000 miles a year.

Under present tax rates the passenger car pays a total of \$38.80 in registration fee and gas tax. The truck in question is paying an estimated \$805.

This means that the car is paying 41 cents per 100 vehicle miles, while the

(CONT. TO PAGE 176, ENCLOSE)



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- BUNALON is a SINGLE LAYER material eliminating between-layer friction.
  - Made from BUNA rubber reinforced with specially woven NYLON fabric.
  - No deterioration from aromatic fuels or crankcase vapors.
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- Mechanics, Jobbers and Motorists everywhere agree KEM Fuel Pumps are superior. Every component is designed and tested to give the utmost in long-lasting service

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MEMBERSHIP CERTIFICATE. Proof to the motorist you're interested in keeping his car rolling.

KEM TUNE-UP DIGEST. Outlines up-to-date tune-up procedure. (1941-51 specs). Only 25¢ for Digest and Member-Certificate.

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You get a new high in

jack performance with the . . . **AUSCO**

# fleet hydraulics

The more you look into this Ausco axle jack

the more you'll **SEE**

why it is far ahead

in dependability and easy operation

Inside the Ausco Hydraulics are many reasons why AUSCO brings you a new high in jack performance. It will pay you to examine this cut-away illustration and see how Ausco's superior engineering makes this jack easier to use, more economical to maintain. Take particular note of these points of superiority:

**SEE** improved AUSCO pressure seal.

Ausco uses a ram packing of oil-impervious synthetic. This material is homogeneous and provides a BETTER SEAL because it expands in *all* directions.

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Exclusive Ausco-developed non-porous castings are guaranteed to be LEAK-PROOF and UNBREAKABLE. In addition, extra pressure is secured at those joints where leakage is most likely.

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**Sticking.** Ausco uses specially impregnated fine-grain leather that remains firm throughout long service periods. This material prevents seepage, adds life to the jack, and prevents sticking, even after long periods of storage.

**SEE** how AUSCO eliminates one of the main causes of hydraulic operating troubles.

Simplified, exclusive STRAIGHT LINE oil flow prevents dirt from accumulating in pump and makes it easier to flush the pump clean.

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for 40 years, one of the world's largest manufacturers of original equipment and replacement hydraulic and mechanical jacks.

1½, 3, 5, 8, 12 &  
20-Ton Capacities



B-5894 CCR

## Highway Costs

Continued from Page 174

truck is paying \$1.79 per 100 vehicle miles, or more than four times as much for every mile traveled.

On a ton-mile basis, however, the car is paying 25 cents per 100 ton-miles, or more than twice as much as the 12 cents paid by the truck.

Therefore, in order to equalize the truck taxes with the car taxes under the ton-mile theory, it would be necessary to increase the truck taxes by

more than 100 per cent—from \$805 to \$1,629.75.

The Bureau of Public Roads has condemned the ton-mile theory in unmistakable language. Among other things, the Bureau has stated:

"The gross ton-mile approach has the virtue of simplicity, since average annual mileages and average operating gross weights can be approximated with reasonable accuracy from available data.

"It also has the superficial and deceptive advantages of appearing to account, in part at least, for several

measures of relative benefit. . . .

"It is far from precise, however, since 10 automobiles will occupy a great deal more space than one truck of the same total gross weight.

"The gross ton-mile unit also tends in the direction of compensating for differential costs, but does so very inaccurately, since

"(1) Wheel load rather than gross load is the major element to be considered in estimating relative thicknesses of surface required for vehicles of different size.

"(2) Neither required thickness nor required cost of surface varies directly with the load factor, and

"(3) Other added costs are related only vaguely, if at all, to gross weight."

The late Joseph B. Eastman, in his historic study of highway taxation, flatly rejected the ton-mile theory.

"The principal merit in the ton-mile method," he said, "but one which does not suffice to commend it for use, is its ease of computation."

Among other things, he pointed out that the ton-mile theory "ignores in important respects the effects of differences in the ways in which loads are transmitted to pavements and roadway structures, and in the utilization of road facilities. It has, therefore, little merit," he concluded.

Just last year, in his testimony before a committee of the U. S. Senate, Thomas H. MacDonald, chief of the Bureau of Public Roads, declared:

"There can be no pretense that the gross ton-mile analysis produces an accurate appraisal of the (highway) costs occasioned by vehicles of different sizes and weights."

Before leaving the ton-mile theory, I want to emphasize a point which stands out in all these statements condemning the theory. It is the point that gross weight and ton-miles have absolutely no significant relationship to highway cost.

Fig. 4 shows two trucks. One has only two axles and a gross weight of only 26,000 lb. The other has 5 axles and a gross weight of 86,000 lb.

Nevertheless, highway construction is determined by the weight of individual axles and not gross weight. Therefore, the smaller truck, having only one 20,000-lb axle, requires the same standard of highway construction as the larger vehicle having four such axles.

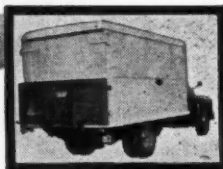
To carry the illustration a little farther, let's assume that the rear axle of the smaller truck weighed 25,000 lb. It then would require a better and more costly highway than the large truck, although its gross weight still would be only 31,000 lb.

(TURN TO PAGE 178, PLEASE)



\*You can double the number of deliveries per day with Anthony LIFT GATES to do the heavy loading and unloading. These hydraulic "freight elevators" keep trucks on the move . . . Cut down on "stopped" time with speedier pick-ups and deliveries.

**IMPROVE YOUR SERVICE**  
LIFT GATES "dramatize" deliveries. Handle merchandise gently and carefully. Eliminate damage claims. Reduce personnel accidents.



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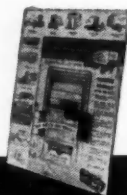
One man can wheel a bulky, heavy load onto a LIFT GATE . . . lift it with smooth, hydraulic power . . . and wheel it into the truck . . . all in a matter of seconds. Simple, safe, trouble-free LIFT GATES lift all types of loads, up to 2000 lbs. Load or unload from curb, dock and ground levels. Cut costs up to 50% and more. Available in types, and with power closing, to fit your needs.

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**GYROMATIC GRINDER** finish grinds side of ring. This is the finest grind used today. It is known as Gyrex Finish.



**EXHAUSTIVE INSPECTIONS** and checks are made on all rings. This is only one of numerous inspection operations.

American Hammered Piston Rings are now being manufactured in one of the largest and most modern piston ring plants in the world. The unmatched manufacturing and engineering facilities now being used by American Hammered will really pay off for fleet owners in lowered maintenance and operating costs.

The processes illustrated here (and many others not illustrated) assure top quality piston rings designed for any and every engine condition. When a maintenance check indicates engine overhaul or re-ringing, insist on American Hammered Piston Rings—the rings that do their job the best.

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*Automotive Replacement Division*



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### KOETHERIZING PROCESS



Stresses have collapsed piston by pushing skirt inward, causing piston slap and ring wear.



Inside of piston skirt being peened with shot at the rate of 16,000 a second, causing rapid, accurate expansion.



Resizing is finished in seconds, and, because Koetherizing takes place when metal is cold, the piston will never collapse again.

**More pistons have been resized by Koetherizing than by any other method.**



## Highway Costs

Continued from Page 176

### Operating Cost Theory

LET'S turn now to a second theory of highway cost allocation which is getting increased attention. This one is known as the operating-cost theory.

Since highways are used for commercial purposes and for private purposes which have economic values, there appears to be great attraction in

the attempt to allocate tax responsibility on the basis of value received by the highway user.

It is this reasoning which underlies the operating-cost theory proposing that motor vehicle operating costs, which rise steadily with size of vehicle, may be taken as a measure of the value of service provided, and therefore as a basis for assignment of road-user tax responsibility.

Thus, if it were found that the cost of operation of a passenger car was 8 cents per mile and that of a tractor-trailer combination was 48 cents per

mile, then the tax liability of the combination would be 6 times that of the passenger car *per mile*.

If the annual mileage of the combination were 5 times that of the passenger car, then their required *annual* tax payment would be in the ratio of 30 to 1.

Fig. 5 gives you an idea of how this works out in dollars and cents. As we saw in an earlier table, under existing tax rates in Pennsylvania, the typical passenger car running 9500 miles is paying \$38.80 a year, while the 40,000-lb combination running 45,000 miles is paying \$805 a year.

Under the operating cost theory, we have estimated that the combination should pay 30 times as much as the passenger car. In order to equalize the taxes on this basis, we would have to increase the annual taxes of the combination to \$1,102, or by 37 per cent.

Chief deficiency of the operating-cost theory, which it shares with the ton-mile theory and all other concepts based on value of service, is that it takes no account of the highway costs occasioned by the use of vehicles of different types and sizes.

This essential factor can only be taken into account by the third and final major theory of highway cost assignment which I'd like to discuss.

### Incremental Theory

IT is the incremental theory which, though difficult to apply, generally is conceded to be the soundest theory. It seeks to determine what costs the government incurs to accommodate vehicles of different sizes and weights, and to tax the different vehicles accordingly.

The first step in making an incremental study is a scientific determination of what type of roads would be necessary if there were no large and heavy vehicles, and roads had to be built only to withstand the elements and carry light passenger car traffic.

Such a road generally is referred to as a "basic" road. This basic road is required by all motor vehicles. Therefore, once the cost of the basic road is determined, the cost of such road is assigned equally among all motor vehicles on the basis of vehicle-miles operated.

Then, the difference in the cost of the basic road and the cost of the roads actually built to accommodate all traffic, is assigned in its entirety to the heavier vehicles which, theoretically at least, are responsible for this added cost.

In that connection it is important to  
(TURN TO PAGE 180, PLEASE)

COMMERCIAL CAR JOURNAL, July, 1952



Pitted cylinder sleeve

Rusted out water jacket

Corroded water pump impeller

# NOW...

## Corrosion Damage TO ENGINE PARTS IS UNNECESSARY



**ELECTRO-CHEMICAL**

# Perry filter

**COOLING SYSTEM**

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**PROVIDES 5 WAY  
PREVENTIVE MAINTENANCE**

1. Exclusive protection against pitting
2. Cleans system and keeps it clean
3. Prevents all-over rusting
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5. Removes foreign particles

### Here's what users say about the Perry Filter

"They are a 'must' with us, they keep a clean system clean, and do a good job of cleaning a dirty system."—WESTERN TRANSP. CO., Watertown, South Dakota

"All of our road vans have these filters on them. We wouldn't run a road van now without them."—ROY WILSON TRANS. & WHS., Longview, Texas

"We have installed the Perry Water Filter 100% on all of our fleet of Trucks. It has cut our cost of cooling system troubles by 50%."—LUCKY STORES INC., San Leandro, California

"We installed our first Perry Filter on Feb. 9, 1950 and they are giving satisfactory service. We are installing them on all our power units."—READING TRANSPORTATION CO., Philadelphia, Pennsylvania

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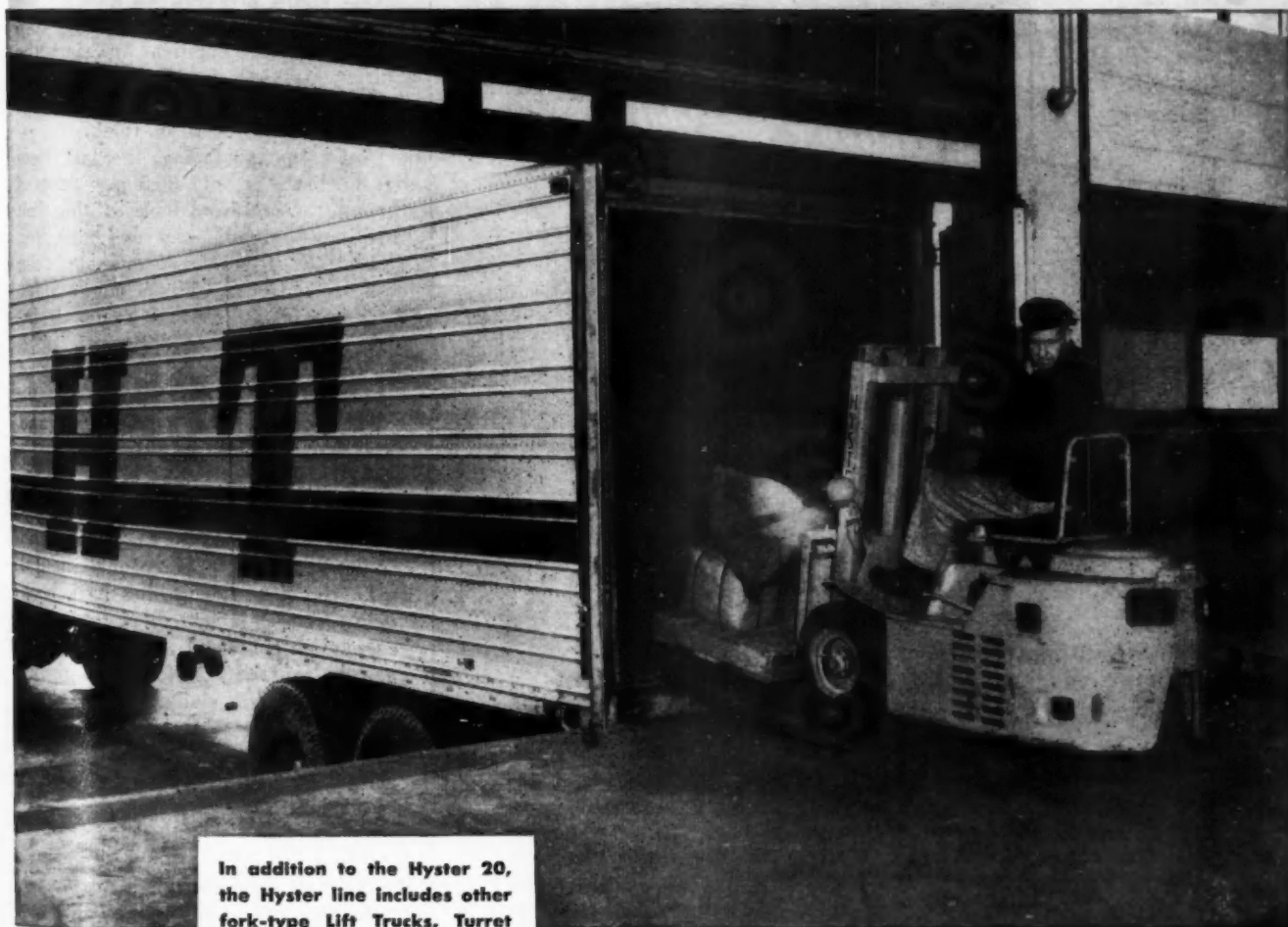
*"hustles"  
the loads*

**for  
MOTOR FREIGHT  
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The motor freight industry is full of high speed operations — has to be if profits are made. Hundreds of "hustling" little and sturdy Hyster 20 Lift Trucks are doing "hurry up" jobs for motor freight men.

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## Highway Costs

Continued from Page 178

keep in mind that most elements of highway cost are not affected by the size and weight of vehicles. This fact is deliberately ignored by the railroad propagandists, and is overlooked by those who are not familiar with the facts.

The thickness of the actual road surface itself is the chief factor influenced by heavy vehicles. Even here, the addi-

tional costs are much less than the average layman might imagine. For example, there is only a couple of inches difference in the thickness of pavements built to carry the heaviest traffic and the thickness required simply to withstand the elements.

This point is illustrated in Fig. 6 taken from a study made in Pennsylvania 20 years ago by the Bureau of Public Roads. This table shows required pavement thicknesses for varying wheel loads.

In this old study, the basic minimum pavement required to withstand the

elements was considered to be a pavement 6 in. thick at the edge and 5 in. thick at the center, or an approximate average thickness of 5½ in. Notice that as compared with the basic requirement of 5½ in., the thickness required to handle a wheel load of 9,750 lb, the heaviest on the chart, is only 7⅞ in.—a difference of 2⅜ in.

The last column shows the extent to which the *pavement cost* per mile increased as the thickness increased. Of course, these cost figures are out of date, since prices were much lower at the time the study was made than they are today. However, relatively speaking, the ratios would be about the same. The cost of a pavement adequate to carry wheel loads of 9,750 lb was only 18 per cent greater than the cost of the basic pavement required to withstand the elements.

Let me emphasize that the percentage by which the heaviest vehicles might increase the cost of *surfaces* is much greater than the percentage by which such vehicles increase *total highway costs*.

Fig. 7 will give you an idea of the major elements of cost in a modern highway. These figures are for the Shirley Highway in Virginia. It is a four-lane divided concrete highway, and the concrete is 10 in. thick.

Notice that surfacing, the last item on the list was only 30.5 per cent of the total cost. Now look at the first two items—right-of-way and grading. These two items alone exceeded the cost of surfacing. When you add to these two items the cost of minor drainage, landscaping, curbing, signs & markers, it means that 43 per cent of the cost of the highway was *completely* independent of motor vehicle size and weight.

### Watch Out for Pitfalls

**B**ECAUSE of the time, knowledge and data required for a real incremental study, very few such studies have been made. A quickie incremental analysis was made a couple of years ago by the engineer of the California Highway Dept. I cite his study as a warning that the incremental theory can be badly distorted.

He was asked by a California highway committee to determine the difference in the cost of highways adequate for autos and light trucks, as against the cost of highways adequate for all legal types of vehicles. Fig. 8 (Page 182) shows the factors which he used in making his determination.

From the standpoint of highway thickness, he assumed that a highway capable of carrying 8,000-lb axle loads

(TURN TO PAGE 182, PLEASE)



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COMMERCIAL CAR JOURNAL, July, 1952

181

## Highway Costs

Continued from Page 180

would be adequate. Bureau of Public Roads data indicate that a highway capable of withstanding the elements is adequate to carry axle loads of 11,200 lb. So he didn't give the heavier vehicles any the best of it with respect to this factor.

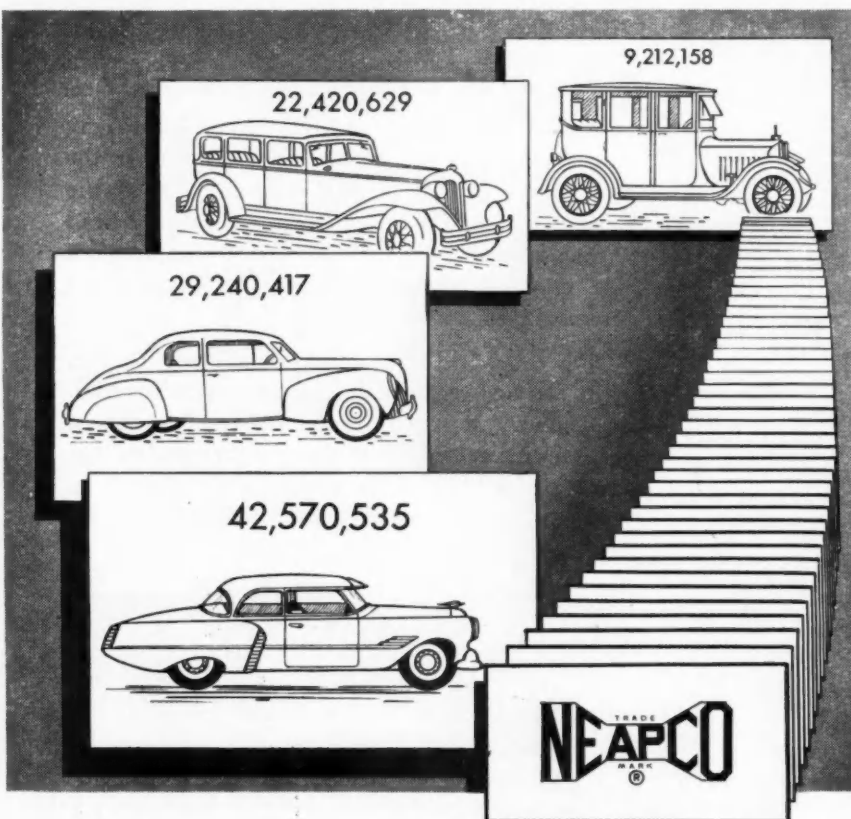
From the standpoint of highway widths, he assumed that lanes of 10-ft

FIG. 8. CALIFORNIA STUDY REVEALS PITFALLS

	Basic Highway	Actual Highway
Pavement Thickness	8,000 lbs. per axle	18,000 lbs. per axle
Lane Width	10 ft.	12 ft.
Shoulders	7 ft.	8 ft.
Bridge	H-5	H-20516
Vertical Clearance	12 ft.	15 ft.

*Ton-mile theory, like any other, must use sound basic facts. This study used barest minimums for basic highway. See text for full discussion of procedures*

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width would be adequate for the lighter vehicles, as compared with the 12-ft lanes which usually are constructed. Leading highway engineers are in general agreement that width of roads and lanes is determined more by the volume of traffic than the size of particular vehicles, and that the great speed of passenger cars is a more important factor than the size of trucks.

Excellent proof of this point is the fact that our parkways, like the Merritt Parkway in Connecticut, from which commercial vehicles are prohibited, are just as wide as general purpose roads.

There are also shining examples in the California engineer's own state which make it clear that his comparison is highly theoretical rather than practical. The Arroyo Seco Freeway between Los Angeles and Pasadena, not used by trucks, is a six-lane divided highway. The inner lanes are 11 ft wide; the middle lanes are 12 ft wide, and the outer lanes are 13 ft wide.

On the question of bridge structures, he used the barest minimum bridge for comparison with the best bridges now being constructed. This might be justified in theory, but hardly as a practical matter. The H-5 bridge wouldn't even carry highway construction equipment and would preclude many thousands of medium farm trucks. Such bridges also would render the highway system useless from the standpoint of national defense.

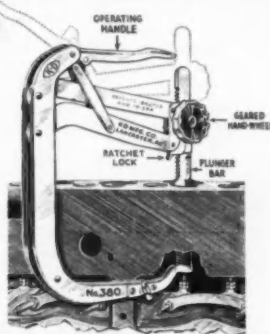
In any event, on the basis of these comparative standards, the California engineer analyzed the cost of 105 California projects which involved construction of first-class modern highways. Actual cost of these projects was \$43,600,000. He figured that if the highways had been built to meet only his debatable basic minimum standards, the cost would have been reduced to \$35,700,000. Thus, he concluded that larger vehicles having axle-loads in excess of 8,000 lb, caused an additional cost of 22 per cent, or \$7,900,000.

(TURN TO PAGE 222, PLEASE)

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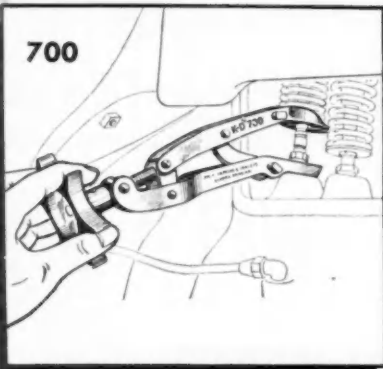


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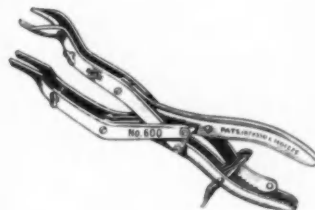
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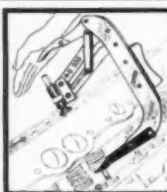
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920 Set



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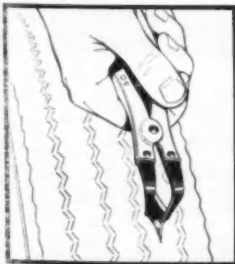
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TRAV-L-RAK



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## Highway Costs

Continued from Page 182

His findings up to this point, while debatable, might have been considered reasonable theoretically. However, when the engineer attempted to assign responsibility for the basic highway cost, he made a serious error. Instead of assigning the basic cost on the basis of vehicle-miles operated, he did it on the basis of ton-miles operated.

### Two Theories at Once

HE mated two separate theories of highway taxation, the incremental theory and the ton-mile theory, and came up with a hybrid method which assigns an utterly ridiculous share of the tax burden to the heavy vehicles.

He said that the heavy vehicles accounted for 45 per cent of the basic cost. By the time he had added this astonishing share of the basic cost to the added cost already assigned to the larger vehicles, he had charged them with 55 per cent of the cost of the projects.

You can see how ridiculous this conclusion is when you bear in mind that this 55 per cent of the cost would be charged against just those vehicles

with axle loads exceeding 8,000 lb.

The payment of lighter commercial vehicles would boost the payments of ALL commercial vehicles to something like 70 or 80 per cent. Thus, passenger cars, accounting for more than 80 per cent of California vehicles, would be held accountable for only 20 or 30 per cent of the taxes. And, apparently, the other beneficiaries—property owners and the general public—would be assigned no cost at all.

Fortunately the study did our industry no harm in California. However, it has been cited repeatedly in other states by those who are unfriendly to the industry.

I have discussed this California study at some length because it shows how even a sound approach can be distorted, and because it is of extreme importance that you keep a close watch and do everything you can to avoid a repetition in your own state.

The only really complete and comprehensive national incremental study ever made was the one called "Public Aids to Transportation," published a dozen years ago. It was and is more commonly known as the Eastman Report.

In applying the incremental method, the Eastman Study first divided the cost of various types of highways and streets

between motor vehicles as an entire group and other highway beneficiaries. The motor vehicle share of the cost of the basic highway was distributed among all motor vehicles on the basis of vehicle-miles operated.

The difference between the estimated cost of the basic highway and the cost of the highways actually built to accommodate all types of vehicles was

(TURN TO PAGE 224, PLEASE)



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with Magnus 755. This safe, sure, carbonized-oil solvent will quickly, easily and economically remove the sludge from any engine. Usually sluggish, oil-pumping engines are brought back to top-notch efficiency in less than an hour.

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### It's Easy with #755!

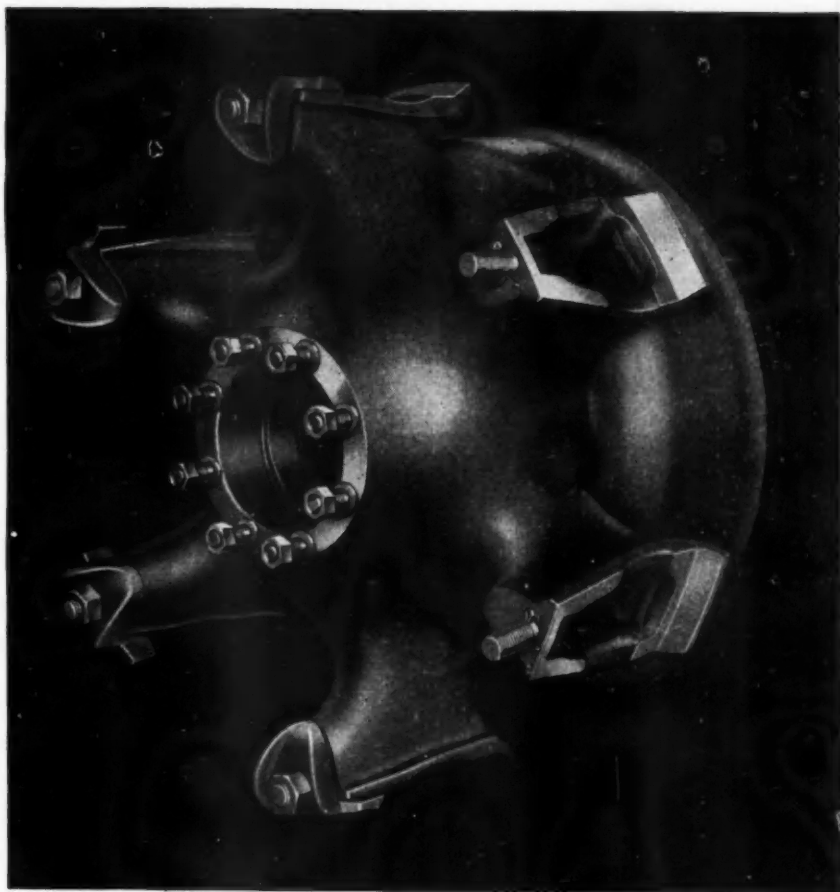
See pages 10-13 of the Magnus Truck and Bus Cleaning Manual for the routine. Write for a copy if you haven't one handy!

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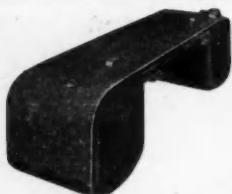
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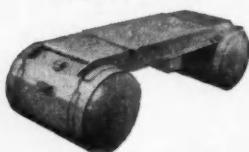


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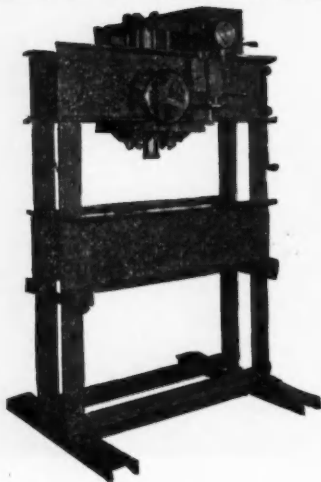
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### Highway Costs

Continued from Page 222

assigned in its entirety against the larger and heavier vehicles.

Having thus assigned cost responsibility to all the various classes of vehicles, such costs then were compared with the highway tax payments made by each class of vehicles.

The report found that the cost assignable to passenger cars was approximately the same as their tax payments. As a group, the larger and heavier vehicles were found to have paid taxes substantially in excess of the cost assigned to them.

Today, those who seek to saddle the trucking industry with punitive ton-mile taxes try to discount the Eastman Report. They say it is out-of-date, and meaningless.

We must concede that the facts and figures are out-of-date. But the sound, fair and practical principles laid down in the Eastman Report are no more out-of-date than the Constitution or the Bill of Rights. If those same principles were applied objectively to today's facts and figures, the general results would probably be about the same.

#### Two-Front Battle

**I**N CLOSING, let me point out that we are in a two-front battle. I have tried to convey various aspects involved on the theoretical or scientific front. The importance of this front is undeniable.

However, we must not for a moment neglect the propaganda front. We've got to get our story to the public. We've got to get to the public with simple hard-hitting facts that anyone can understand, and thus build up a resistance in the public mind to the ruthless and misleading attacks being made against us.

If we are going to meet this attack, there is no room for pessimism, interiority complexes or hang-dog attitudes.

END

Please Resume Reading Page 54

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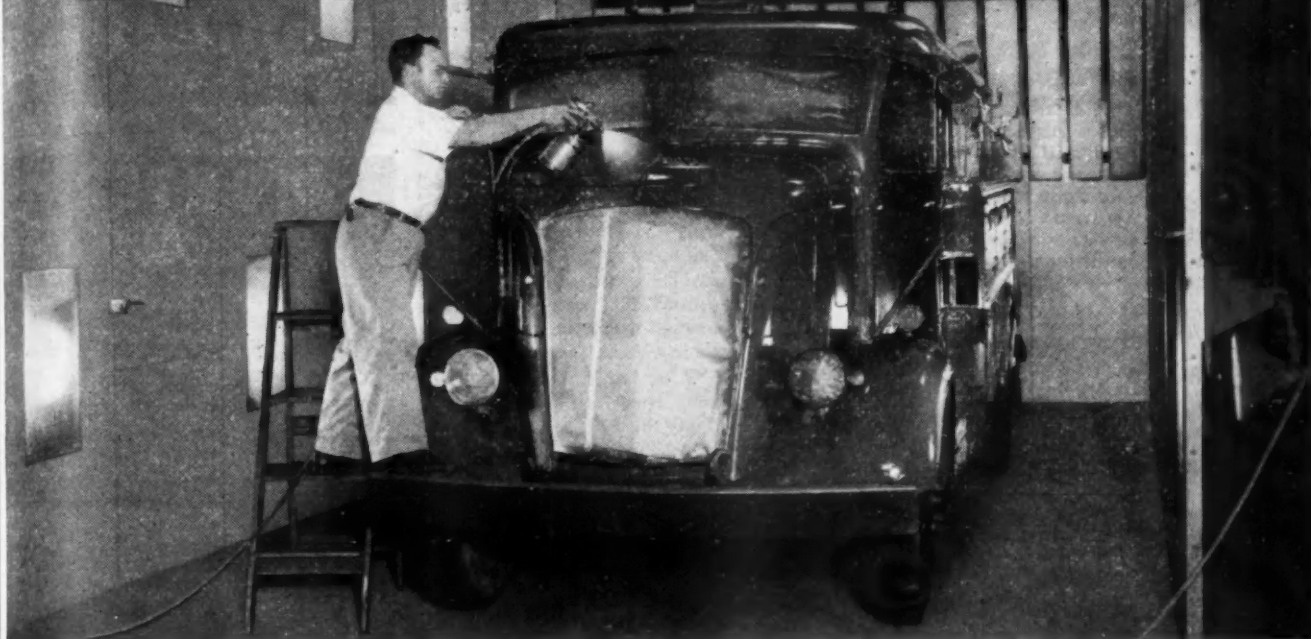
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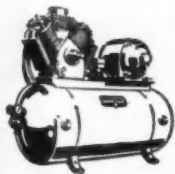
For sound advice call your local DeVilbiss Jobber, or our nearest Branch Office.

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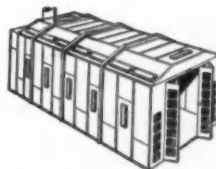
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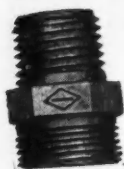
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## Fleetman's Library

Three bulletins have been issued by the Buda Co., Harvey, Ill., under Nos. 1579, 1580 and 1581. They describe in detail Buda fork lift truck models FT30-24, FT40-18 and FT40-10 respectively.

Chek-Chart's 1952 automotive lubrication guide is a 130-page lubrication service guide just off the press, available from The Chek-Chart Corp., Chicago.

Windshield Wipers made by the Anderson Co., with replacement parts and specifications are listed in a catalog made available recently. While this catalog was designed primarily for jobber countermen or distributor salesmen, it will be a handy reference for any fleet shop. For example, the publisher states that only seven of their vacuum models would be needed to replace vacuum wiper motors on all vehicles from 1935 to the present. Copies may be obtained from Dept. MC, The Anderson Co., Gary 40, Ind.

Petroleum Dictionary and Products Manual, a 502-page reference book, has been published by Petroleum Educational Institute, Los Angeles, Calif. There are over 6000 entries containing non-technical definitions of terms used in the petroleum industry. It covers fuels, lubricants and petroleum by-products in all phases of transportation and industry with their uses and applications. Price \$8 from the publisher.

Fork extensions for lift trucks are used for sheet metals and objects of extreme length. Towmotor Corp., Cleveland, Ohio, has published a data sheet on fork extensions which shows how they work, where they are installed, and gives the extension dimensions for each Towmotor model on which they may be installed.

Scales by Howe that weigh everything from a postcard to a 60-ton truck combination are described in detail in a condensed catalog now available. Howe Scale Co., Rutland, Vt.

Fageol vans, their uses, overall dimensions and specifications are presented in a brochure now available from Twin Coach Co., Kent, Ohio, or from distributors.

Floor drill, No. 3000, made by Cincinnati Lathe & Tool Co., Canedy-Otto division, Cincinnati, Ohio, is described in a catalog D-110 now offered for distribution.

Sheet metal fabricators, often used around the body shop, are described in Catalog 10-A, just published by Wales-Strippit Corp., N. Tonawanda, N. Y. Using closeup pictures, the catalog shows the various operations and work positions possible with the Wales fabricator, and lists the capacity ratings and dimensions of the machine.

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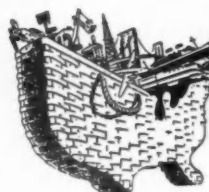
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